

US EPA RECORDS CENTER REGION 5



1010299

RCRA FACILITY INVESTIGATION PHASE I REPORT

VOLUME 4

ANALYTICAL LABORATORY RESULTS MAY 1998 RESAMPLING EVENT

Prepared for:

Minnesota Mining and Manufacturing (3M)
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July 1998

optimizing environmental resources - water, air, earth

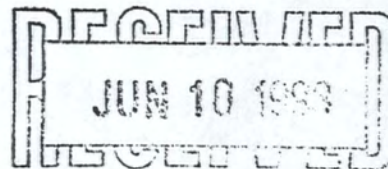
CORDOVA RFI

**MAY 1998
ANALYTICAL REPORT**

LOT #: A8E070148

Quanterra Incorporated
4101 Shuffel Drive, NW
North Canton, Ohio 44720

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ANALYTICAL REPORT

CORDOVA RFI MAY 1998

Lot #: A8E070148

Carol Snyder

3M Company

QUANTERRA INCORPORATED

Jeffrey C. Smith / R. St. H.
Jeffrey C. Smith
Project Manager

May 20, 1998

CASE NARRATIVE

The following report contains the analytical results for six water samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were received May 7, 1998 according to documented sample acceptance procedures.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder on May 14 and 15, 1998, and to Meg Clark on May 15, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Sample submitted for normal turn around time are reported under a separate cover.

The samples were received at the laboratory at temperatures of 0.5, 0.6, 0.4, and 1.5° C.

SUPPLEMENTAL QC INFORMATION

GENERAL CHEMISTRY

Matrix spike/matrix spike duplicate recoveries were outside the acceptance limits for Cyanide on batches 8128185 and 8131254. However, the acceptable laboratory control sample analysis data indicated that the analytical system was operating within control and this condition is most likely due to matrix interference.

ANALYTICAL METHODS SUMMARY

A8E070148

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>
Amenable Cyanide	SW846 9012
Inductively Coupled Plasma (ICP) Metals	SW846 6010B
Mercury in Liquid Waste (Manual Cold-Vapor)	SW846 7470A
Organochlorine Pesticides	SW846 8081A
PCBs	SW846 8082
Semivolatile Organic Compounds by GC/MS	SW846 8270C
Total Cyanide	SW846 9012
Total Cyanide	SW846 9012A
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010B
Volatile Organics by GC/MS	SW846 8260B

References:

- SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

A8E070148

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CH0XM	001	RFI-I (RES) MW9-90 (MS/MSD 2)	05/06/98	10:22
CH108	002	RFI-I (RES) MW4-94	05/06/98	11:57
CH10A	003	FIELD DUPLICATE #2	05/06/98	11:57
CH10G	004	RFI-I (RES) MW7-90	05/06/98	14:07
CH10H	005	FIELD DUPLICATE #3	05/06/98	14:07
CH2EW	006	FIELD BLANK #3	05/06/98	16:04

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

3M COMPANY

Client Sample ID: RFI-I (RES) MW9-90 (MS/MSD 2)

General Chemistry

Lot-Sample #....: A8E070148-001 Work Order #....: CH0XM
Date Sampled....: 05/06/98 10:22 Date Received...: 05/07/98

Matrix.....: WATER

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Amenable Cyanide	ND	5.0	ug/L	SW846 9012	05/12-05/13/98	8132160
		Dilution Factor: 1				
Total Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128185
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: RFI-I (RES) MW4-94

General Chemistry

Lot-Sample #....: A8E070148-002 Work Order #....: CH108
 Date Sampled....: 05/06/98 11:57 Date Received...: 05/07/98

Matrix.....: WATER

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128185
		Dilution Factor: 1				
Total Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128185
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: FIELD DUPLICATE #2

General Chemistry

Lot-Sample #....: A8E070148-003 Work Order #....: CH10A Matrix.....: WATER
 Date Sampled....: 05/06/98 11:57 Date Received...: 05/07/98

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	5.0	ug/L	SW846 9012	05/12-05/13/98	8132160
	Dilution Factor: 1					
Total Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128144
	Dilution Factor: 1					

3M COMPANY

Client Sample ID: RFI-I (RES) MW7-90

General Chemistry

Lot-Sample #....: A8E070148-004 Work Order #....: CH10G
 Date Sampled....: 05/06/98 14:07 Date Received...: 05/07/98

Matrix.....: WATER

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128185
		Dilution Factor: 1				
Total Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128185
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: FIELD DUPLICATE #3

General Chemistry

Lot-Sample #....: A8E070148-005 Work Order #....: CH10H
Date Sampled....: 05/06/98 14:07 Date Received...: 05/07/98

Matrix.....: WATER

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Amenable Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128185
		Dilution Factor: 1				
Total Cyanide	ND	5.0	ug/L	SW846 9012	05/08-05/09/98	8128185
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: FIELD BLANK #3

General Chemistry

Lot-Sample #....: A8E070148-006 Work Order #....: CH2EW
Date Sampled....: 05/06/98 16:04 Date Received...: 05/07/98

Matrix.....: WATER

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	5.0	ug/L	SW846 9012	05/12-05/13/98	8132204
	Dilution Factor: 1					
Total Cyanide	ND	5.0	ug/L	SW846 9012	05/11-05/14/98	8131254
	Dilution Factor: 1					

QUALITY CONTROL SECTION

QUALITY CONTROL ELEMENTS OF SW-846 METHODS

Quanterra® Incorporated conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

QC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. Quanterra requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. Failure to meet the established recovery guidelines requires the reparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). Failure of the RPDs to fall within the laboratory-generated acceptance windows requires the reparation and reanalysis of all samples in the QC batch. The only exception is that if the MS/MSD RPDs are within acceptance criteria, the batch is acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except for the common laboratory contaminants indicated below.

Volatile (GC or GC/MS)

Methylene chloride
Acetone
2-Butanone

Semivolatile (GC/MS)

Phthalate Esters

Metals

Copper
Iron
Zinc
Lead*

** for analyses run on TJA Trace ICP or GFAA only*

QUALITY CONTROL ELEMENTS OF SW-846 METHODS (continued)

METHOD BLANK (continued)

The listed volatile and semivolatile compounds may be present in concentrations up to 5 times the reporting limits. The listed metals may be present in concentrations up to 2 times the reporting limit or must be twenty fold less than the results of the environmental samples. Failure to meet these Method Blank criteria requires the reparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. When these values fail to meet acceptance criteria, the data is reviewed to determine the cause. If, in the analyst's judgment, sample matrix effects are indicated, no corrective action is performed. Otherwise, the MS/MSD and the environmental sample used to prepare them are reprepared and reanalyzed.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample are spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

The acceptance criteria do not apply to samples that are diluted. If the dilution is more than 5X, the recoveries will be reported as diluted out. All other surrogate recoveries will be reported. If the LCS, LCSD, or the Method Blank surrogates fail to meet recovery criteria (exception for dilutions), the entire batch of samples is reprepared and reanalyzed.

If the surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank and the associated sample(s) are ND, the batch is acceptable. If the surrogate recoveries are outside criteria for environmental or MS/MSD samples, the batch may be acceptable based on the analyst's judgment that sample matrix effects are indicated.

For the GC/MS BNA methods, the surrogate criteria is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide/PCB, PAH, TPH, and Herbicide methods, the surrogate criteria is that one of two surrogate compounds meet acceptance criteria.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #....: A8E010101

Matrix.....: WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	100	Work Order #: CH1XH103 (70 - 130) Dilution Factor: 1	SW846 9012	LCS Lot-Sample#: A8E080000-185 05/08-05/09/98	8128185
Amenable Cyanide	99	Work Order #: CH3V9102 (70 - 130) Dilution Factor: 1	SW846 9012	LCS Lot-Sample#: A8E120000-160 05/12-05/13/98	8132160
Amenable Cyanide	106	Work Order #: CH44N103 (70 - 130) Dilution Factor: 1	SW846 9012	LCS Lot-Sample#: A8E120000-204 05/12-05/13/98	8132204
Cyanide (Free)	81	Work Order #: CH8QX102 (70 - 130) Dilution Factor: 1	SM18 4500-CN-I	LCS Lot-Sample#: A8E180000-227 05/18/98	8138227
Total Cyanide	105	Work Order #: CH1M5102 (70 - 130) Dilution Factor: 1	SW846 9012	LCS Lot-Sample#: A8E080000-144 05/08-05/09/98	8128144
Total Cyanide	100	Work Order #: CH1XH102 (70 - 130) Dilution Factor: 1	SW846 9012	LCS Lot-Sample#: A8E080000-185 05/08-05/09/98	8128185
Total Cyanide	99	Work Order #: CH3D4102 (70 - 130) Dilution Factor: 1	SW846 9012	LCS Lot-Sample#: A8E110000-254 05/11-05/14/98	8131254

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: A8E070148

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	Work Order #: CH1XH101 5.0 Dilution Factor: 1	ug/L	MB Lot-Sample #: A8E080000-185 SW846 9012	05/08-05/09/98	8128185
Amenable Cyanide	ND	Work Order #: CH3V9101 5.0 Dilution Factor: 1	ug/L	MB Lot-Sample #: A8E120000-160 SW846 9012	05/12-05/13/98	8132160
Amenable Cyanide	ND	Work Order #: CH44N101 5.0 Dilution Factor: 1	ug/L	MB Lot-Sample #: A8E120000-204 SW846 9012	05/12-05/13/98	8132204
Total Cyanide	ND	Work Order #: CH1M5101 5.0 Dilution Factor: 1	ug/L	MB Lot-Sample #: A8E080000-144 SW846 9012	05/08-05/09/98	8128144
Total Cyanide	ND	Work Order #: CH1XH101 5.0 Dilution Factor: 1	ug/L	MB Lot-Sample #: A8E080000-185 SW846 9012	05/08-05/09/98	8128185
Total Cyanide	ND	Work Order #: CH3D4101 5.0 Dilution Factor: 1	ug/L	MB Lot-Sample #: A8E110000-254 SW846 9012	05/11-05/14/98	8131254

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: A8E070148

Matrix.....: WATER

Date Sampled...: 04/30/98

Date Received...: 05/02/98

PARAMETER	PERCENT RECOVERY	RPD	PREPARATION-	PREP
	RECOVERY LIMITS	RPD LIMITS	ANALYSIS DATE	BATCH #
Total Cyanide	WO#: CGRAG11C-MS/CGRAG11D-MSD	MS Lot-Sample #: A8D290160-004		
86	(70 - 130)	SW846 9012	05/08-05/09/98	8128144
84	(70 - 130) 2.6 (0-20)	SW846 9012	05/08-05/09/98	8128144
	Dilution Factor: 1			
Total Cyanide	WO#: CGTGQ10X-MS/CGTGQ110-MSD	MS Lot-Sample #: A8E010101-002		
0.0 N	(70 - 130)	SW846 9012	05/08-05/09/98	8128185
0.0 N	(70 - 130) 0.0 (0-20)	SW846 9012	05/08-05/09/98	8128185
	Dilution Factor: 1			
Total Cyanide	WO#: CGTGQ12E-MS/CGTGQ12F-MSD	MS Lot-Sample #: A8E010101-002		
7.0 N	(70 - 130)	SW846 9012	05/11-05/14/98	8131254
5.9 N	(70 - 130) 18 (0-20)	SW846 9012	05/11-05/14/98	8131254
	Dilution Factor: 1			
Total Cyanide	WO#: CH0XM105-MS/CH0XM106-MSD	MS Lot-Sample #: A8E070148-001		
92	(70 - 130)	SW846 9012	05/08-05/09/98	8128185
88	(70 - 130) 3.4 (0-20)	SW846 9012	05/08-05/09/98	8128185
	Dilution Factor: 1			
Total Cyanide	WO#: CH0XM107-MS/CH0XM108-MSD	MS Lot-Sample #: A8E070148-001		
100	(70 - 130)	SW846 9012	05/12-05/13/98	8132160
95	(70 - 130) 5.6 (0-20)	SW846 9012	05/12-05/13/98	8132160
	Dilution Factor: 1			

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

results for ms/msd confirmed.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: A8E110109

Matrix.....: WATER

Date Sampled...: 05/08/98 16:10 Date Received...: 05/09/98

PARAMETER	PERCENT RECOVERY	RPD	PREPARATION-	PREP
	RECOVERY LIMITS	RPD LIMITS	ANALYSIS DATE	BATCH #
Total Cyanide		WO#: CH36K10A-MS/CH36K10C-MSD	MS Lot-Sample #: A8E110109-001	
	NC,MSB (70 - 130)	MCAWW 335.2	05/12-05/13/98	8132204
	NC,MSB (70 - 130)	(0-20) MCAWW 335.2	05/12-05/13/98	8132204
	Dilution Factor: 1			

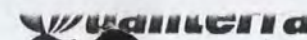
NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

NC The recovery and RPD were not calculated.

MSB The recovery and RPD were not calculated because the sample amount was greater than four times the spike amount.

Chain of Custody Record



QUA-4149-1

Client 3M Company			Project Manager John Hunter			Date May 6, 1998			Page 1 of 1		
Address 935 Bush Ave.			Telephone Number (Area Code)/Fax Number (612) 778-5388			Lab Location North Canton, OH			Analysis		
City St. Paul	State MN	Zip Code 55144-1000	Site Contact Carol Snyder								
Project Number/Name Cordova RFI May 1998			Carrier/Waybill Number Fed Ex: 8005 4025 1738								
Contract/Purchase Order/Quote Number											

Sample I.D. Number and Description	Date	Time	Sample Type	Containers			Preservative	Condition on Receipt/Comments	HCB - 9080A VOC - 9250A TOTAL DETERMINATION 9012												
				Volume	Type	No.															
RFI - I (REG) MW9-90	5/6/98	10:22	Water	1 Liter	Amber	2	NONE		X												
↓	↓	↓	↓	250ml	PLASTIC	1	NaOH	Rush (results w/i 6 days)	X	X											
RFI - I (REG) MW9-90 (MS/MG *2)	5/6/98	10:22	↓	1 Liter	Amber	2	NONE		X												
↓	↓	↓	↓	250ml	PLASTIC	1	NaOH			X											
RFI - I (REG) MW4-94	5/6/98	11:57	↓	1 Liter	Amber	2	NONE		X												
↓	↓	↓	↓	250ml	PLASTIC	1	NaOH	Rush (results w/i 6 days)	X	X											
Field Duplicate #2	5/6/98	11:57	↓	1 Liter	Amber	2	NONE		X												
↓	↓	↓	↓	250ml	PLASTIC	1	NaOH	Rush (results w/i 6 days)	X	X											
RFI - I (REG) MW7-90	5/6/98	14:07	↓	1 Liter	Amber	2	NONE		X												
↓	↓	↓	↓	250ml	PLASTIC	1	NaOH	Rush (results w/i 6 days)	X	X											
Field Duplicate #3	5/6/98	14:07	↓	1 Liter	Amber	2	NONE		X												
↓	↓	↓	↓	250ml	PLASTIC	1	NaOH	Rush (results w/i 6 days)	X	X											
RFI - I (REG) MW4-90	5/6/98	15:40	↓	1 Liter	Amber	2	NONE		X												
↓	↓	↓	↓	250ml	PLASTIC	1	NaOH	Hold	X	X											
Field Blank #3	5/6/98	16:04	↓	1 Liter	Amber	2	NONE		X												
↓	↓	↓	↓	250ml	PLASTIC	1	NaOH		X	X											

Special Instructions: **TEMP BLANK** 5/6/98 **NA** **Water** **PLASTIC** **1** **NONE** **Temp. at 3.5°C upon shipment**
 Call **Cothy Larson** 612-551-2474 or **Carol Snyder** w/ Questions

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☒ Normal ☒ Rush ☐ Other _____ QC Level: **A3 P2A DONT PLAN** ☐ I. ☐ II. ☐ III. Project Specific Requirements (Specify):

1. Relinquished By 	Date 5/6/98	Time 17:23	1. Received By	Date	Time
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By 	Date 5-7-98	Time 10⁰⁰ A

Comments: **Custody Seals 042671 & 042666**

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Chain of Custody Record

Custody
Seals: 042656 + 042691

QUA-4149-1

Client 3M - CORDOVA IL			Project Manager John Hunter			Date May 6, 1998			Page 1 of 1		
Address 935 BUSH AVENUE			Telephone Number (Area Code)/Fax Number 612-778-5388			Lab Location Quanterra, N. Canton			Analysis (2)		
City St Paul	State MN	Zip Code 55144-1000	Site Contact Carol Snyder								
Project Number/Name Cordova RFI - May 1998			Carrier/Waybill Number FED EX: 8005-4025-1727								
Contract/Purchase Order/Quote Number 102801 / 10100											

Sample I.D. Number and Description	Date	Time	Sample Type	Containers			Preservative	Condition on Receipt/Comments	As	Co	HCB	PCB	To Temp	Measuring
				Volume	Type	No.								
Temperature Blank 55-5/6	5-6-98	-	Water	40 ml	Plastic	1	None							
✓ RFI-1 (RES) 55-5		0900	Soil	120 ml	Glass	3	None		X	X	X	X		
✓ RFI-1 (RES) 55-12		0930	↓	↓	↓	↓	↓		X	X	X	X		
✓ RFI-1 (RES) 55-16		1030	↓	↓	↓	↓	↓		X	X	X	X		
✓ Field Blank 9		1050	Water	1 liter	Plastic	1	HNO ₃		X	X	X	X		
✓ " "		↓	↓	↓	Glass	2	None		X	X	X	X		
✓ RFI-1 (RES) 55-13		1145	Soil	120 ml	Glass	3	None		X	X	X	X		
✓ RFI-1 (RES) 55-14		1245	↓	↓	↓	↓	↓		X	X	X	X		
✓ RFI-1 (RES) 55-17		1345	↓	↓	↓	↓	↓		X	X	X	X		
✓ RFI-1 (RES) 55-18		1430	↓	↓	↓	↓	↓		X	X	X	X		
✓ RFI-1 (RES) 55-3		1520	↓	↓	↓	↓	↓		X	X	X	X		

Special Instructions

Call Cathy Larson 612-551-2474 OR Carol Snyder 612-778-5388 w/ questions

Possible Hazard Identification				Sample Disposal				(A fee may be assessed if samples are retained longer than 3 months)			
<input checked="" type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown	<input type="checkbox"/> Return To Client	<input checked="" type="checkbox"/> Disposal By Lab	<input type="checkbox"/> Archive For _____ Months				
Turn Around Time Required				QC Level See Work Plan				Project Specific Requirements (Specify)			
<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Rush	<input type="checkbox"/> Other _____	<input type="checkbox"/> I. <input type="checkbox"/> II. <input type="checkbox"/> III.		See 3M-Cordova-RFI Work Plan						
1. Relinquished By <i>[Signature]</i>				Date	Time	1. Received By <i>[Signature]</i>				Date	Time
				5-6-98	1605					5/6/98	1005
2. Relinquished By <i>[Signature]</i>				Date	Time	2. Received By <i>[Signature]</i>				Date	Time
				5/6/98	1720						
3. Relinquished By <i>[Signature]</i>				Date	Time	3. Received By <i>[Signature]</i>				Date	Time
										5-7-98	1000

Comments

① Exception: Water w/in Plastic 1 liter pH < 2 / HNO₃ Preservative
 ② Temp Blank at 2.1°C prior to shipment ~ 16405/6

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

CORDOVA RFI

**MAY 1998
ANALYTICAL REPORT**

LOT #: A8E060157

Quanterra Incorporated
4101 Shuffel Drive, NW
North Canton, Ohio 44720

216 497-9396 Telephone
216 497-0772 Fax

ANALYTICAL REPORT


CORDOVA RFI MAY 1998

Lot #: A8E060157

Carol Snyder

3M Company

QUANTERRA INCORPORATED


Jeffrey C. Smith
Project Manager

June 15, 1998

CASE NARRATIVE

The following report contains the analytical results for fifteen water samples and thirteen solid samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were received May 6, 1998 according to documented sample acceptance procedures.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder on June 2 and 5, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

The coolers were received at the laboratory at temperatures of 1.2, 0.6, 1.1, 0.5, 0.5 and 0.2° C.

SUPPLEMENTAL QC INFORMATION

SAMPLE RECEIVING

Three 40ml volatile vials for sample Trip blank were received with headspace.

The analysis was not marked on the chain-of-custody for sample Field Duplicate #1. The sample was logged for method 8081A per the Work Plan.

GC/MS VOLATILES

The matrix spike/matrix spike duplicate associated with batch 8134287 failed surrogate recovery criteria. The laboratory control sample associated with this batch was in control. This is believed to be a matrix effect; therefore, no further corrective action was taken.

GC SEMIVOLATILES – Organochlorine Pesticides

The matrix spike/matrix spike duplicate associated with sample RFI-I (RES) MW5-90 (MS/MSD 1) on batch 8128110 exhibited recoveries and RPD outside the acceptable QC limits. The laboratory control sample was recovered at acceptable or slightly high levels indicating that the analytical system was operating with in control and this condition is most likely due to matrix interference.

Samples RFI-I (RES) SS-7 (MS/MSD 7) were diluted due to matrix effects and was ND; therefore, the detection limites were elevated.

CASE NARRATIVE (continued)

GC SEMIVOLATILES – Polychlorinated Biphenyls

Matrix spike recovery data cannot be used to determine the analytical precision or accuracy due to the complex nature of the sample matrix. Samples were diluted out due to matrix interferences.

Samples RFI-I (RES) SS-20 (MS/MSD 6), RFI-I (RES) SS-21, RFI-I (RES) SS-22, and Field Duplicate were diluted due to matrix effects and was ND; therefore, the detection limits were elevated.

METALS

Matrix spike/spike duplicate spike recoveries were outside the acceptance limits for some analytes. The acceptable laboratory control sample analysis data indicated that the analytical system was operating within control and this condition is most likely due to matrix interference. See the Matrix Spike Report for the affected analytes which will be flagged with "N".

Matrix spike/spike duplicate relative percent difference (RPD) exceeded the acceptance limits for some analytes. The imprecision may be attributed to sample heterogeneity. See the Matrix Spike Report for the affected analytes which will be flagged with "**".

SAMPLE SUMMARY

A8K060157

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CGXX2	001	FIELD BLANK 1	05/04/98	13:04
CGXX4	002	EQUIPMENT BLANK 1	05/04/98	16:02
CGXX9	003	RFI-I (RES) MW5-90 (MS/MSD 1)	05/04/98	18:39
CGXXC	004	RFI-I (RES) MW6-90	05/05/98	09:17
CGXXE	005	RFI-I (RES) MW1-94	05/05/98	12:14
CGXXF	006	RFI-I (RES) MW2-94	05/05/98	13:56
CGXXG	007	RFI-I (RES) MW7-94	05/05/98	14:55
CGXXJ	008	EQUIPMENT BLANK #2	05/05/98	15:26
CGXXK	009	FIELD BLANK #2	05/05/98	15:50
CGXXL	010	FIELD DUPLICATE #1	05/04/98	18:39
CGXXN	011	TRIP BLANK	05/04/98	
CGXXT	012	FIELD BLANK 7	05/05/98	08:45
CH000	013	EQUIPMENT BLANK 4	05/05/98	09:00
CH003	014	RFI-1 (RES) SS-25	05/05/98	09:45
CH009	015	RFI-1 (RES) SS-26	05/05/98	10:20
CH00C	016	RFI-1 (RES) SS-27	05/05/98	11:00
CH00E	017	FIELD BLANK 8	05/05/98	13:40
CH00G	018	RFI-1 (RES) SS-20 (MS/MSD 6)	05/05/98	13:55
CH00K	019	RFI-1 (RES) SS-7 (MS/MSD 7)	05/05/98	14:40
CH00Q	020	RFI-1 (RES) SS-21	05/05/98	15:45
CH00W	021	FIELD BLANK 6	05/04/98	18:40
CH00X	022	RFI-I (RES) SS-1 (MS/MSD 4)	05/04/98	15:55
CH015	023	RFI-I (RES) SS-28	05/04/98	17:10
CH016	024	RFI-I (RES) SS-22	05/04/98	18:30
CH01A	025	RFI-I (RES) SS-23	05/04/98	17:50
CH01G	026	FIELD DUPLICATE 5	05/04/98	15:55
CH01L	027	FIELD DUPLICATE 6	05/04/98	17:10
CH02L	028	RFI-1 (RES) SS-24 (MS/MSD5)	05/04/98	19:20

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

ANALYTICAL METHODS SUMMARY

A8E060157

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>
Amenable Cyanide	SW846 9012
Inductively Coupled Plasma (ICP) Metals	SW846 6010A
Organochlorine Pesticides	SW846 8081A
PCBs	SW846 8082
Total Cyanide	SW846 9012
Total Residue as Percent Solids	MCAWW 160.3 MOD
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010A
Volatile Organics by GC/MS	SW846 8260A

References:

- MCAWW "Methods for Chemical Analysis of Water and Wastes",
EPA-600/4-79-020, March 1983 and subsequent revisions.
- SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical
Methods", Third Edition, November 1986 and its updates.

3M COMPANY

Client Sample ID: FIELD BLANK 1

GC Semivolatiles

Lot-Sample #....: A8E060157-001 Work Order #....: CGXX2102 Matrix.....: WATER
 Date Sampled....: 05/04/98 13:04 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8128110
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	56	(10 - 130)
Decachlorobiphenyl	80	(10 - 116)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK 1

GC/MS Volatiles

Lot-Sample #....: A8E060157-002 Work Order #....: CGXX4104
 Date Sampled....: 05/04/98 16:02 Date Received...: 05/06/98
 Prep Date.....: 05/14/98 Analysis Date...: 05/14/98
 Prep Batch #....: 8134287
 Dilution Factor: 1 Method.....: SW846 8260A

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	0.71	0.25	ug/L
Chloromethane	ND	2.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Ethyl methacrylate	ND	1.0	ug/L
2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	40	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	ND	1.0	ug/L

(Continued on next page)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK 1

GC/MS Volatiles

Lot-Sample #...: A8E060157-002 Work Order #...: CGXX4104 Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
p-Dichlorobenzene	ND	1.0	ug/L
m-Dichlorobenzene	ND	1.0	ug/L
o-Dichlorobenzene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	93	(69 - 127)
Toluene-d8	96	(90 - 112)
Bromofluorobenzene	94	(87 - 114)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK 1

GC Semivolatiles

Lot-Sample #....: A8E060157-002 Work Order #....: CGXX4101 Matrix.....: WATER
 Date Sampled....: 05/04/98 16:02 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8128110
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	60	(10 - 130)
Decachlorobiphenyl	74	(10 - 116)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK 1

General Chemistry

Lot-Sample #....: A8E060157-002 Work Order #....: CGXX4
Date Sampled....: 05/04/98 16:02 Date Received...: 05/06/98

Matrix.....: WATER

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND V	10	ug/L	SW846 9012	05/15-05/18/98	8135242
	Dilution Factor: 2					
Total Cyanide	22	10	ug/L	SW846 9012	05/15-05/18/98	8135242
	Dilution Factor: 2					

NOTE(S):

RL Reporting Limit

V Elevated reporting limit. The reporting limit is elevated due to limited sample volume.

3M COMPANY

Client Sample ID: RFI-I (RES) MW5-90 (MS/MSD 1)

GC Semivolatiles

Lot-Sample #....: A8E060157-003 Work Order #....: CGXX9101 Matrix.....: WATER
 Date Sampled....: 05/04/98 18:39 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8128110
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	58	(10 - 130)
Decachlorobiphenyl	62	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW6-90

GC Semivolatiles

Lot-Sample #....: A8E060157-004 Work Order #....: CGXXC101 Matrix.....: WATER
 Date Sampled....: 05/05/98 09:17 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8128110
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	58	(10 - 130)
Decachlorobiphenyl	73	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW1-94

GC Semivolatiles

Lot-Sample #....: A8E060157-005 Work Order #....: CGXXE101 Matrix.....: WATER
 Date Sampled....: 05/05/98 12:14 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8128110
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	52	(10 - 130)
Decachlorobiphenyl	66	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW2-94

GC Semivolatiles

Lot-Sample #....: A8E060157-006 Work Order #....: CGXXF101 Matrix.....: WATER
Date Sampled....: 05/05/98 13:56 Date Received...: 05/06/98
Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
Prep Batch #....: 8128110
Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	58	(10 - 130)
Decachlorobiphenyl	74	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW7-94

GC Semivolatiles

Lot-Sample #....: A8E060157-007 Work Order #....: CGXXG101 Matrix.....: WATER
 Date Sampled....: 05/05/98 14:55 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8128110
 Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	54	(10 - 130)
Decachlorobiphenyl	67	(10 - 116)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK #2

GC Semivolatiles

Lot-Sample #....: A8E060157-008 Work Order #....: CGXXJ102 Matrix.....: WATER
 Date Sampled....: 05/05/98 15:26 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8128110
 Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	55	(10 - 130)
Decachlorobiphenyl	76	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK #2

GC Semivolatiles

Lot-Sample #....: A8E060157-009 Work Order #....: CGXXK102 Matrix.....: WATER
 Date Sampled....: 05/05/98 15:50 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8128110
 Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	52	(10 - 130)
Decachlorobiphenyl	67	(10 - 116)

3M COMPANY

Client Sample ID: FIELD DUPLICATE #1

GC Semivolatiles

Lot-Sample #....: A8E060157-010 Work Order #....: CGXXL102 Matrix.....: WATER
Date Sampled....: 05/04/98 18:39 Date Received...: 05/06/98
Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
Prep Batch #....: 8128110
Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	55	(10 - 130)
Decachlorobiphenyl	70	(10 - 116)

3M COMPANY

Client Sample ID: TRIP BLANK

GC/MS Volatiles

Lot-Sample #....: A8E060157-011 Work Order #....: CGXXN101
 Date Sampled....: 05/04/98 Date Received...: 05/06/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/12/98
 Prep Batch #....: 8133164
 Dilution Factor: 1 Method.....: SW846 8260A

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	ND	0.25	ug/L
Chloromethane	ND	2.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Ethyl methacrylate	ND	1.0	ug/L
2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	40	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	ND	1.0	ug/L

(Continued on next page)

3M COMPANY

Client Sample ID: TRIP BLANK

GC/MS Volatiles

Lot-Sample #...: A8E060157-011 Work Order #...: CGXXN101

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
p-Dichlorobenzene	ND	1.0	ug/L
m-Dichlorobenzene	ND	1.0	ug/L
o-Dichlorobenzene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	80	(69 - 127)
Toluene-d8	103	(90 - 112)
Bromofluorobenzene	102	(87 - 114)

3M COMPANY

Client Sample ID: FIELD BLANK 7

GC Semivolatiles

Lot-Sample #....: A8E060157-012 Work Order #....: CGXXT103 Matrix.....: WATER
Date Sampled...: 05/05/98 08:45 Date Received...: 05/06/98
Prep Date.....: 05/08/98 Analysis Date...: 05/27/98
Prep Batch #....: 8128113
Dilution Factor: 1 Method.....: SW846 8082

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	79	(10 - 130)
Decachlorobiphenyl	82	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK 7

TOTAL Metals

Lot-Sample #...: A8E060157-012

Matrix.....: WATER

Date Sampled...: 05/05/98 08:45 Date Received...: 05/06/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #...: 8132253						
Arsenic	ND	5.0	ug/L	SW846 6010A	05/13-05/18/98	CGXXT102
		Dilution Factor: 1				
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CGXXT101
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: EQUIPMENT BLANK 4

GC Semivolatiles

Lot-Sample #....: A8E060157-013 Work Order #....: CH000104 Matrix.....: WATER
 Date Sampled....: 05/05/98 09:00 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/27/98
 Prep Batch #....: 8128110
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	56	(10 - 130)
Decachlorobiphenyl	74	(10 - 116)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK 4

GC Semivolatiles

Lot-Sample #....: A8E060157-013 Work Order #....: CH000103 Matrix.....: WATER
Date Sampled....: 05/05/98 09:00 Date Received...: 05/06/98
Prep Date.....: 05/08/98 Analysis Date...: 05/27/98
Prep Batch #....: 8128113
Dilution Factor: 1 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING	
		LIMIT	UNITS
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L
SURROGATE	PERCENT RECOVERY	RECOVERY	
		LIMITS	
Tetrachloro-m-xylene	87	(10 - 130)	
Decachlorobiphenyl	86	(10 - 116)	

3M COMPANY

Client Sample ID: EQUIPMENT BLANK 4

TOTAL Metals

Lot-Sample #...: A8E060157-013

Matrix.....: WATER

Date Sampled...: 05/05/98 09:00 Date Received...: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 8132253						
Arsenic	ND	5.0	ug/L	SW846 6010A	05/13-05/18/98	CH000102
		Dilution Factor: 1				
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH000101
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-25

GC Semivolatiles

Lot-Sample #....: A8E060157-014 Work Order #....: CH003104 Matrix.....: SOLID
Date Sampled....: 05/05/98 09:45 Date Received...: 05/06/98
Prep Date.....: 05/13/98 Analysis Date...: 05/25/98
Prep Batch #....: 8133101
Dilution Factor: 1
% Moisture.....: 6.3 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	35	ug/kg
Aroclor 1221	ND	35	ug/kg
Aroclor 1232	ND	35	ug/kg
Aroclor 1242	ND	35	ug/kg
Aroclor 1248	ND	35	ug/kg
Aroclor 1254	ND	35	ug/kg
Aroclor 1260	ND	35	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	94	(8.0- 129)
Decachlorobiphenyl	101	(0.0- 138)

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-25

TOTAL Metals

Lot-Sample #....: A8E060157-014

Matrix.....: SOLID

Date Sampled....: 05/05/98 09:45 Date Received...: 05/06/98

% Moisture.....: 6.3

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8135119						
Arsenic	1200	1070	ug/kg	SW846 6010A	05/15-05/18/98	CH003102
		Dilution Factor: 1				
Cobalt	ND	5340	ug/kg	SW846 6010A	05/15-05/18/98	CH003103
		Dilution Factor: 1				

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-25

General Chemistry

Lot-Sample #....: A8E060157-014 Work Order #....: CH003
Date Sampled....: 05/05/98 09:45 Date Received...: 05/06/98
% Moisture.....: 6.3

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	93.7	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127137
	Dilution Factor: 1					

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-26

GC Semivolatiles

Lot-Sample #...: A8E060157-015 Work Order #...: CH009104 Matrix.....: SOLID
Date Sampled...: 05/05/98 10:20 Date Received...: 05/06/98
Prep Date.....: 05/13/98 Analysis Date...: 05/25/98
Prep Batch #...: 8133101
Dilution Factor: 1
% Moisture.....: 8.2 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING	
		LIMIT	UNITS
Aroclor 1016	ND	36	ug/kg
Aroclor 1221	ND	36	ug/kg
Aroclor 1232	ND	36	ug/kg
Aroclor 1242	ND	36	ug/kg
Aroclor 1248	ND	36	ug/kg
Aroclor 1254	ND	36	ug/kg
Aroclor 1260	ND	36	ug/kg

SURROGATE	PERCENT	
	RECOVERY	RECOVERY
Tetrachloro-m-xylene	88	(8.0- 129)
Decachlorobiphenyl	100	(0.0- 138)

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RKS) SS-26

TOTAL Metals

Lot-Sample #...: A8E060157-015

Matrix.....: SOLID

Date Sampled...: 05/05/98 10:20 Date Received...: 05/06/98

% Moisture.....: 8.2

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 8135119						
Arsenic	1490	1090	ug/kg	SW846 6010A	05/15-05/18/98	CH009102
		Dilution Factor: 1				
Cobalt	ND	5450	ug/kg	SW846 6010A	05/15-05/18/98	CH009103
		Dilution Factor: 1				

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-26

General Chemistry

Lot-Sample #....: A8E060157-015 Work Order #....: CH009 Matrix.....: SOLID
Date Sampled....: 05/05/98 10:20 Date Received...: 05/06/98
% Moisture.....: 8.2

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	91.8	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127137

Dilution Factor: 1

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-27

GC Semivolatiles

Lot-Sample #....: A8E060157-016 Work Order #....: CH00C104 Matrix.....: SOLID
Date Sampled....: 05/05/98 11:00 Date Received...: 05/06/98
Prep Date.....: 05/13/98 Analysis Date...: 05/25/98
Prep Batch #....: 8133101
Dilution Factor: 1
% Moisture.....: 9.1 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	36	ug/kg
Aroclor 1221	ND	36	ug/kg
Aroclor 1232	ND	36	ug/kg
Aroclor 1242	ND	36	ug/kg
Aroclor 1248	ND	36	ug/kg
Aroclor 1254	ND	36	ug/kg
Aroclor 1260	ND	36	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	106	(8.0- 129)
Decachlorobiphenyl	111	(0.0- 138)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-27

TOTAL Metals

Lot-Sample #....: A8E060157-016

Matrix.....: SOLID

Date Sampled....: 05/05/98 11:00 Date Received...: 05/06/98

% Moisture.....: 9.1

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #....: 8135119						
Arsenic	1330	1100	ug/kg	SW846 6010A	05/15-05/18/98	CH00C102
		Dilution Factor: 1				
Cobalt	7000	5500	ug/kg	SW846 6010A	05/15-05/18/98	CH00C103
		Dilution Factor: 1				

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-27

General Chemistry

Lot-Sample #....: A8E060157-016 Work Order #....: CH00C Matrix.....: SOLID
 Date Sampled...: 05/05/98 11:00 Date Received...: 05/06/98
 % Moisture.....: 9.1

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	90.9	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127139
	Dilution Factor: 1					

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD BLANK 8

GC Semivolatiles

Lot-Sample #....: A8E060157-017 Work Order #....: CH00E103 Matrix.....: WATER
 Date Sampled....: 05/05/98 13:40 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8128110
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	52	(10 - 130)
Decachlorobiphenyl	76	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK 8

GC Semivolatiles

Lot-Sample #....: A8E060157-017 Work Order #....: CH00E102
Date Sampled....: 05/05/98 13:40 Date Received...: 05/06/98
Prep Date.....: 05/08/98 Analysis Date...: 05/27/98
Prep Batch #....: 8128113
Dilution Factor: 1 Method.....: SW846 8082

Matrix.....: WATER

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	84	(10 - 130)
Decachlorobiphenyl	94	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK 8

TOTAL Metals

Lot-Sample #...: A8E060157-017

Matrix.....: WATER

Date Sampled...: 05/05/98 13:40 Date Received...: 05/06/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #...: 8132253						
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH00E101
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-20 (MS/MSD 6)

GC Semivolatiles

Lot-Sample #....: A8E060157-018 Work Order #....: CH00G103
Date Sampled....: 05/05/98 13:55 Date Received...: 05/06/98
Prep Date.....: 05/13/98 Analysis Date...: 06/02/98
Prep Batch #....: 8133101
Dilution Factor: 20
% Moisture.....: 16 Method.....: SW846 8082

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	780	ug/kg
Aroclor 1221	ND	780	ug/kg
Aroclor 1232	ND	780	ug/kg
Aroclor 1242	ND	780	ug/kg
Aroclor 1248	ND	780	ug/kg
Aroclor 1254	ND	780	ug/kg
Aroclor 1260	ND	780	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	210 DIL, *	(8.0- 129)
Decachlorobiphenyl	349 DIL, *	(0.0- 138)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-20 (MS/MSD 6)

TOTAL Metals

Lot-Sample #....: A8E060157-018

Matrix.....: SOLID

Date Sampled....: 05/05/98 13:55 Date Received...: 05/06/98

% Moisture.....: 16

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8135119						
Cobalt	53000	5920	ug/kg	SW846 6010A	05/15-05/18/98	CH00G102
Dilution Factor: 1						

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-7 (MS/MSD 7)

GC Semivolatiles

Lot-Sample #....: A8E060157-019 Work Order #....: CH00K102 Matrix.....: SOLID
Date Sampled....: 05/05/98 14:40 Date Received...: 05/06/98
Prep Date.....: 05/12/98 Analysis Date...: 05/27/98
Prep Batch #....: 8132108
Dilution Factor: 1
% Moisture.....: 13 Method.....: SW846 8082

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Aroclor 1016	ND	38	ug/kg
Aroclor 1221	ND	38	ug/kg
Aroclor 1232	ND	38	ug/kg
Aroclor 1242	ND	38	ug/kg
Aroclor 1248	ND	38	ug/kg
Aroclor 1254	ND	38	ug/kg
Aroclor 1260	ND	38	ug/kg

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	87	(8.0- 129)
Decachlorobiphenyl	90	(0.0- 138)

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-20 (MS/MSD 6)

General Chemistry

Lot-Sample #....: A8E060157-018 Work Order #....: CH00G Matrix.....: SOLID
 Date Sampled....: 05/05/98 13:55 Date Received...: 05/06/98
 % Moisture.....: 16

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	84.4	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127139

Dilution Factor: 1

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-7 (MS/MSD 7)

GC Semivolatiles

Lot-Sample #....: A8E060157-019 Work Order #....: CH00K105 Matrix.....: SOLID
 Date Sampled....: 05/05/98 14:40 Date Received...: 05/06/98
 Prep Date.....: 05/12/98 Analysis Date...: 06/01/98
 Prep Batch #....: 8132107
 Dilution Factor: 10
 % Moisture.....: 13 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	38	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	0.0 DIL, *	(8.0- 129)
Decachlorobiphenyl	231 DIL, *	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-7 (MS/MSD 7)

General Chemistry

Lot-Sample #....: A8E060157-019 Work Order #....: CH00K Matrix.....: SOLID
 Date Sampled....: 05/05/98 14:40 Date Received...: 05/06/98
 % Moisture.....: 13

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	86.5	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127139

Dilution Factor: 1

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-21

GC Semivolatiles

Lot-Sample #....: A8E060157-020 Work Order #....: CH00Q103
Date Sampled....: 05/05/98 15:45 Date Received...: 05/06/98
Prep Date.....: 05/13/98 Analysis Date...: 06/02/98
Prep Batch #....: 8133101
Dilution Factor: 20
% Moisture.....: 11 Method.....: SW846 8082

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	740	ug/kg
Aroclor 1221	ND	740	ug/kg
Aroclor 1232	ND	740	ug/kg
Aroclor 1242	ND	740	ug/kg
Aroclor 1248	ND	740	ug/kg
Aroclor 1254	ND	740	ug/kg
Aroclor 1260	ND	740	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	96 DIL	(8.0- 129)
Decachlorobiphenyl	194 DIL, *	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-21

TOTAL Metals

Lot-Sample #....: A8E060157-020

Matrix.....: SOLID

Date Sampled....: 05/05/98 15:45 Date Received...: 05/06/98

% Moisture.....: 11

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8135119						
Cobalt	50600	5600	ug/kg	SW846 6010A	05/15-05/18/98	CH00Q102

Dilution Factor: 1

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD BLANK 6

GC Semivolatiles

Lot-Sample #....: A8E060157-021 Work Order #....: CH00W104 Matrix.....: WATER
 Date Sampled....: 05/04/98 18:40 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8128110
 Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	52	(10 - 130)
Decachlorobiphenyl	75	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK 6

GC Semivolatiles

Lot-Sample #....: A8E060157-021 Work Order #....: CH00W103 Matrix.....: WATER
Date Sampled....: 05/04/98 18:40 Date Received...: 05/06/98
Prep Date.....: 05/08/98 Analysis Date...: 05/27/98
Prep Batch #....: 8128113
Dilution Factor: 1 Method.....: SW846 8082

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	86	(10 - 130)
Decachlorobiphenyl	91	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK 6

TOTAL Metals

Lot-Sample #....: A8E060157-021

Matrix.....: WATER

Date Sampled....: 05/04/98 18:40 Date Received...: 05/06/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #....: 8132253						
Arsenic	ND	5.0	ug/L	SW846 6010A	05/13-05/18/98	CH00W102
		Dilution Factor: 1				
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH00W101
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: RFI-I (RES) SS-1 (MS/MSD 4)

GC Semivolatiles

Lot-Sample #....: A8E060157-022 Work Order #....: CH00X103 Matrix.....: SOLID
 Date Sampled....: 05/04/98 15:55 Date Received...: 05/06/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/29/98
 Prep Batch #....: 8132107
 Dilution Factor: 1
 % Moisture.....: 8.7 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	3.6	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	140 DIL, *	(8.0- 129)
Decachlorobiphenyl	962 DIL, *	(0.0- 138)

NOTE (S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-1 (MS/MSD 4)

GC Semivolatiles

Lot-Sample #....: A8E060157-022 Work Order #....: CH00X102
Date Sampled....: 05/04/98 15:55 Date Received...: 05/06/98
Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
Prep Batch #....: 8132108
Dilution Factor: 1
% Moisture.....: 8.7 Method.....: SW846 8082

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	36	ug/kg
Aroclor 1221	ND	36	ug/kg
Aroclor 1232	ND	36	ug/kg
Aroclor 1242	ND	36	ug/kg
Aroclor 1248	ND	36	ug/kg
Aroclor 1254	ND	36	ug/kg
Aroclor 1260	ND	36	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	64	(8.0- 129)
Decachlorobiphenyl	51	(0.0- 138)

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-1 (MS/MSD 4)

General Chemistry

Lot-Sample #....: A8E060157-022 Work Order #....: CH00X Matrix.....: SOLID
Date Sampled....: 05/04/98 15:55 Date Received...: 05/06/98
% Moisture.....: 8.7

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	91.3	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127139
Dilution Factor: 1						

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-28

GC Semivolatiles

Lot-Sample #....: A8E060157-023 Work Order #....: CH015104 Matrix.....: SOLID
Date Sampled....: 05/04/98 17:10 Date Received...: 05/06/98
Prep Date.....: 05/13/98 Analysis Date...: 05/25/98
Prep Batch #....: 8133101
Dilution Factor: 1
% Moisture.....: 8.5 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	36	ug/kg
Aroclor 1221	ND	36	ug/kg
Aroclor 1232	ND	36	ug/kg
Aroclor 1242	ND	36	ug/kg
Aroclor 1248	ND	36	ug/kg
Aroclor 1254	ND	36	ug/kg
Aroclor 1260	ND	36	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	113	(8.0- 129)
Decachlorobiphenyl	142 *	(0.0- 138)

NOTE(S) :

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-28

TOTAL Metals

Lot-Sample #....: A8E060157-023

Matrix.....: SOLID

Date Sampled....: 05/04/98 17:10 Date Received...: 05/06/98

% Moisture.....: 8.5

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #....: 8135119						
Arsenic	1320	1090	ug/kg	SW846 6010A	05/15-05/18/98	CH015102
		Dilution Factor: 1				
Cobalt	6480	5460	ug/kg	SW846 6010A	05/15-05/18/98	CH015103
		Dilution Factor: 1				

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-28

General Chemistry

Lot-Sample #....: A8E060157-023 Work Order #....: CH015 Matrix.....: SOLID
Date Sampled...: 05/04/98 17:10 Date Received...: 05/06/98
% Moisture.....: 8.5

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	91.5	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127139

Dilution Factor: 1

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-22

GC Semivolatiles

Lot-Sample #....: A8E060157-024 Work Order #....: CH016104 Matrix.....: SOLID
Date Sampled....: 05/04/98 18:30 Date Received...: 05/06/98
Prep Date.....: 05/13/98 Analysis Date...: 05/29/98
Prep Batch #....: 8133101
Dilution Factor: 10
% Moisture.....: 7.9 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	360	ug/kg
Aroclor 1221	ND	360	ug/kg
Aroclor 1232	ND	360	ug/kg
Aroclor 1242	ND	360	ug/kg
Aroclor 1248	ND	360	ug/kg
Aroclor 1254	ND	360	ug/kg
Aroclor 1260	ND	360	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	79 DIL	(8.0- 129)
Decachlorobiphenyl	146 DIL, *	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-22

TOTAL Metals

Lot-Sample #...: A8E060157-024

Matrix.....: SOLID

Date Sampled...: 05/04/98 18:30 Date Received...: 05/06/98

% Moisture.....: 7.9

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 8135119						
Arsenic	1460	1090	ug/kg	SW846 6010A	05/15-05/18/98	CH016102
		Dilution Factor: 1				
Cobalt	9950	5430	ug/kg	SW846 6010A	05/15-05/18/98	CH016103
		Dilution Factor: 1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-22

General Chemistry

Lot-Sample #....: A8E060157-024 Work Order #....: CH016
Date Sampled....: 05/04/98 18:30 Date Received...: 05/06/98
% Moisture.....: 7.9

Matrix.....: SOLID

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	92.1	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127139

Dilution Factor: 1

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-23

GC Semivolatiles

Lot-Sample #....: A8E060157-025 Work Order #....: CH01A104
Date Sampled....: 05/04/98 17:50 Date Received...: 05/06/98
Prep Date.....: 05/13/98 Analysis Date...: 05/25/98
Prep Batch #....: 8133101
Dilution Factor: 1
% Moisture.....: 9.5 Method.....: SW846 8082

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	36	ug/kg
Aroclor 1221	ND	36	ug/kg
Aroclor 1232	ND	36	ug/kg
Aroclor 1242	ND	36	ug/kg
Aroclor 1248	ND	36	ug/kg
Aroclor 1254	ND	36	ug/kg
Aroclor 1260	ND	36	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	100	(8.0- 129)
Decachlorobiphenyl	106	(0.0- 138)

TE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-23

TOTAL Metals

Lot-Sample #....: A8E060157-025

Date Sampled....: 05/04/98 17:50 Date Received...: 05/06/98

% Moisture.....: 9.5

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8135119						
Arsenic	1510	1100	ug/kg	SW846 6010A	05/15-05/18/98	CH01A102
		Dilution Factor: 1				
Cobalt	7160	5520	ug/kg	SW846 6010A	05/15-05/18/98	CH01A103
		Dilution Factor: 1				

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-23

General Chemistry

Lot-Sample #...: A8E060157-025 Work Order #...: CH01A Matrix.....: SOLID
 Date Sampled...: 05/04/98 17:50 Date Received...: 05/06/98
 % Moisture.....: 9.5

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	90.5	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127139

Dilution Factor: 1

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD DUPLICATE 5

GC Semivolatiles

Lot-Sample #....: A8E060157-026 Work Order #....: CH01G102 Matrix.....: SOLID
Date Sampled....: 05/04/98 15:55 Date Received...: 05/06/98
Prep Date.....: 05/12/98 Analysis Date...: 06/04/98
Prep Batch #....: 8132107
Dilution Factor: 1
% Moisture.....: 9.6 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	3.6	ug/kg

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
Tetrachloro-m-xylene	103	(8.0- 129)
Decachlorobiphenyl	170 *	(0.0- 138)

NOTE(S) :

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD DUPLICATE 5

GC Semivolatiles

Lot-Sample #...: A8E060157-026 Work Order #...: CH01G103 Matrix.....: SOLID
Date Sampled...: 05/04/98 15:55 Date Received...: 05/06/98
Prep Date.....: 05/12/98 Analysis Date...: 05/27/98
Prep Batch #...: 8132108
Dilution Factor: 1
% Moisture.....: 9.6 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	36	ug/kg
Aroclor 1221	ND	36	ug/kg
Aroclor 1232	ND	36	ug/kg
Aroclor 1242	ND	36	ug/kg
Aroclor 1248	ND	36	ug/kg
Aroclor 1254	ND	36	ug/kg
Aroclor 1260	ND	36	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	78	(8.0- 129)
Decachlorobiphenyl	81	(0.0- 138)

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD DUPLICATE 5

General Chemistry

Lot-Sample #....: A8E060157-026 Work Order #....: CH01G
 Date Sampled....: 05/04/98 15:55 Date Received...: 05/06/98
 % Moisture.....: 9.6

Matrix.....: SOLID

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	90.4	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127139

Dilution Factor: 1

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD DUPLICATE 6

GC Semivolatiles

Lot-Sample #....: A8E060157-027 Work Order #....: CH01L104 Matrix.....: SOLID
Date Sampled....: 05/04/98 17:10 Date Received...: 05/06/98
Prep Date.....: 05/13/98 Analysis Date...: 05/29/98
Prep Batch #....: 8133101
Dilution Factor: 10
% Moisture.....: 8.2 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	360	ug/kg
Aroclor 1221	ND	360	ug/kg
Aroclor 1232	ND	360	ug/kg
Aroclor 1242	ND	360	ug/kg
Aroclor 1248	ND	360	ug/kg
Aroclor 1254	ND	360	ug/kg
Aroclor 1260	ND	360	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	88 DIL	(8.0- 129)
Decachlorobiphenyl	134 DIL	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.
Results and reporting limits have been adjusted for dry weight.
Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: FIELD DUPLICATE 6

TOTAL Metals

Lot-Sample #...: A8E060157-027

Matrix.....: SOLID

Date Sampled...: 05/04/98 17:10 Date Received...: 05/06/98

% Moisture.....: 8.2

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 8135119						
Arsenic	1470	1090	ug/kg	SW846 6010A	05/15-05/18/98	CH01L102
		Dilution Factor: 1				
Cobalt	6570	5450	ug/kg	SW846 6010A	05/15-05/18/98	CH01L103
		Dilution Factor: 1				

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD DUPLICATE 6

General Chemistry

Lot-Sample #...: A8E060157-027 Work Order #...: CH01L Matrix.....: SOLID
Date Sampled...: 05/04/98 17:10 Date Received...: 05/06/98
% Moisture.....: 8.2

<u>PARAMETER</u>	<u>RESULT</u>	<u>RL</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Percent Solids	91.8	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127139

Dilution Factor: 1

NOTE (S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-24 (MS/MSD5)

GC Semivolatiles

Lot-Sample #...: A8E060157-028 Work Order #...: CH02L104 Matrix.....: SOLID
Date Sampled...: 05/04/98 19:20 Date Received...: 05/06/98
Prep Date.....: 05/13/98 Analysis Date...: 05/25/98
Prep Batch #...: 8133101
Dilution Factor: 1
% Moisture.....: 16 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	39	ug/kg
Aroclor 1221	ND	39	ug/kg
Aroclor 1232	ND	39	ug/kg
Aroclor 1242	ND	39	ug/kg
Aroclor 1248	ND	39	ug/kg
Aroclor 1254	ND	39	ug/kg
Aroclor 1260	ND	39	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	108	(8.0- 129)
Decachlorobiphenyl	117	(0.0- 138)

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-24 (MS/MSD5)

TOTAL Metals

Lot-Sample #....: A8E060157-028

Matrix.....: SOLID

Date Sampled....: 05/04/98 19:20 Date Received...: 05/06/98

% Moisture.....: 16

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8135119						
Arsenic	1380	1200	ug/kg	SW846 6010A	05/15-05/18/98	CH02L102
		Dilution Factor: 1				
Cobalt	ND	5980	ug/kg	SW846 6010A	05/15-05/18/98	CH02L103
		Dilution Factor: 1				

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-24 (MS/MSD5)

General Chemistry

Lot-Sample #....: A8E060157-028 Work Order #....: CH02L Matrix.....: SOLID
 Date Sampled....: 05/04/98 19:20 Date Received...: 05/06/98
 % Moisture.....: 16

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	83.6	0.10	%	MCAWW 160.3 MOD	05/07-05/08/98	8127139

Dilution Factor: 1

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

QUALITY CONTROL SECTION

QUALITY CONTROL ELEMENTS OF SW-846 METHODS

Quanterra® Incorporated conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

QC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. Quanterra requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. Failure to meet the established recovery guidelines requires the reparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). Failure of the RPDs to fall within the laboratory-generated acceptance windows requires the reparation and reanalysis of all samples in the QC batch. The only exception is that if the MS/MSD RPDs are within acceptance criteria, the batch is acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except for the common laboratory contaminants indicated below.

Volatile (GC or GC/MS)

Methylene chloride
Acetone
2-Butanone

Semivolatile (GC/MS)

Phthalate Esters

Metals

Copper
Iron
Zinc
Lead*

** for analyses run on TJA Trace ICP or GFAA only*

QUALITY CONTROL ELEMENTS OF SW-846 METHODS (continued)

METHOD BLANK (continued)

The listed volatile and semivolatile compounds may be present in concentrations up to 5 times the reporting limits. The listed metals may be present in concentrations up to 2 times the reporting limit or must be twenty fold less than the results of the environmental samples. Failure to meet these Method Blank criteria requires the reparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. When these values fail to meet acceptance criteria, the data is reviewed to determine the cause. If, in the analyst's judgment, sample matrix effects are indicated, no corrective action is performed. Otherwise, the MS/MSD and the environmental sample used to prepare them are reprepared and reanalyzed.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample are spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

The acceptance criteria do not apply to samples that are diluted. If the dilution is more than 5X, the recoveries will be reported as diluted out. All other surrogate recoveries will be reported. If the LCS, LCSD, or the Method Blank surrogates fail to meet recovery criteria (exception for dilutions), the entire batch of samples is reprepared and reanalyzed.

If the surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank and the associated sample(s) are ND, the batch is acceptable. If the surrogate recoveries are outside criteria for environmental or MS/MSD samples, the batch may be acceptable based on the analyst's judgment that sample matrix effects are indicated.

For the GC/MS BNA methods, the surrogate criteria is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide/PCB, PAH, TPH, and Herbicide methods, the surrogate criteria is that one of two surrogate compounds meet acceptance criteria.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #....: A8E060157 Work Order #....: CH4N3102 Matrix.....: WATER
 LCS Lot-Sample#: A8E130000-164
 Prep Date.....: 05/12/98 Analysis Date...: 05/12/98
 Prep Batch #....: 8133164
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
1,1-Dichloroethene	112	(87 - 113)	SW846 8260A
Trichloroethene	98	(89 - 115)	SW846 8260A
Chlorobenzene	105	(89 - 119)	SW846 8260A
Toluene	107	(81 - 117)	SW846 8260A
Benzene	107	(77 - 126)	SW846 8260A

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
1,2-Dichloroethane-d4	85	(69 - 127)
Toluene-d8	98	(90 - 112)
Bromofluorobenzene	99	(87 - 114)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #....: A8E060157 Work Order #....: CH6CN102 Matrix.....: WATER
 LCS Lot-Sample#: A8E140000-287
 Prep Date.....: 05/14/98 Analysis Date...: 05/14/98
 Prep Batch #....: 8134287
 Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
1,1-Dichloroethene	95	(87 - 113)	SW846 8260A
Trichloroethene	91	(89 - 115)	SW846 8260A
Chlorobenzene	100	(89 - 119)	SW846 8260A
Toluene	97	(81 - 117)	SW846 8260A
Benzene	95	(77 - 126)	SW846 8260A

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	88	(69 - 127)
Toluene-d8	98	(90 - 112)
Bromofluorobenzene	92	(87 - 114)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH1HH102 Matrix.....: WATER
 LCS Lot-Sample#: A8E080000-110
 Prep Date.....: 05/08/98 Analysis Date...: 05/27/98
 Prep Batch #...: 8128110
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Lindane	83	(63 - 122)	SW846 8081A
Heptachlor	86	(56 - 125)	SW846 8081A
Aldrin	70	(60 - 117)	SW846 8081A
Dieldrin	90	(63 - 122)	SW846 8081A
Endrin	66	(48 - 129)	SW846 8081A
4,4'-DDT	85	(55 - 128)	SW846 8081A

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	54	(10 - 130)
Decachlorobiphenyl	70	(10 - 116)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E060157 Work Order #....: CH3NF102 Matrix.....: SOLID
 LCS Lot-Sample#: A8E120000-107
 Prep Date.....: 05/12/98 Analysis Date...: 05/30/98
 Prep Batch #....: 8132107
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Lindane	59	(52 - 108)	SW846 8081A
Heptachlor	58	(53 - 130)	SW846 8081A
Aldrin	49	(43 - 116)	SW846 8081A
Dieldrin	62	(62 - 107)	SW846 8081A
Endrin	66	(64 - 127)	SW846 8081A
4,4'-DDT	74	(52 - 128)	SW846 8081A

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	68	(8.0- 129)
Decachlorobiphenyl	64	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E060157 Work Order #....: CH1HX102 Matrix.....: WATER
 LCS Lot-Sample#: A8E080000-113
 Prep Date.....: 05/08/98 Analysis Date...: 05/27/98
 Prep Batch #....: 8128113
 Dilution Factor: 2

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Aroclor 1016	89	(66 - 111)	SW846 8082
Aroclor 1260	95	(65 - 111)	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	97	(10 - 130)
Decachlorobiphenyl	100	(10 - 116)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E060157 Work Order #....: CH4JD102 Matrix.....: SOLID
 LCS Lot-Sample#: A8E130000-101
 Prep Date.....: 05/13/98 Analysis Date...: 05/20/98
 Prep Batch #....: 8133101
 Dilution Factor: 5

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Aroclor 1016	96	(60 - 133)	SW846 8082
Aroclor 1260	105	(59 - 129)	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	89	(8.0- 129)
Decachlorobiphenyl	118	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E060157 Work Order #....: CH3NG102 Matrix.....: SOLID
 LCS Lot-Sample#: A8E120000-108
 Prep Date.....: 05/12/98 Analysis Date...: 05/27/98
 Prep Batch #....: 8132108
 Dilution Factor: 2

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Aroclor 1016	93	(60 - 133)	SW846 8082
Aroclor 1260	100	(59 - 129)	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	98	(8.0- 129)
Decachlorobiphenyl	115	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E060157

Matrix.....: WATER

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
LCS Lot-Sample#:	A8E120000-253	Prep Batch #....: 8132253			
Cobalt	96	(83 - 107)	SW846 6010A	05/13-05/18/98	CH4EA103
		Dilution Factor: 1			
Arsenic	92	(86 - 114)	SW846 6010A	05/13-05/18/98	CH4EA104
		Dilution Factor: 1			

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: A8E060157

Matrix.....: SOLID

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
LCS Lot-Sample#: A8E150000-119 Prep Batch #...: 8135119					
Cobalt	93	(80 - 104)	SW846 6010A	05/15-05/18/98	CH6F4102
		Dilution Factor: 1			
Arsenic	87	(80 - 106)	SW846 6010A	05/15-05/18/98	CH6F4104
		Dilution Factor: 1			

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #....: A8E060157

Matrix.....: WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	75	Work Order #: CH74N104 (70 - 130)	LCS Lot-Sample#: A8E150000-242 SW846 9012	05/15-05/18/98	8135242
Dilution Factor: 2					

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #....: A8E060157
 MB Lot-Sample #: A8E130000-164
 Analysis Date...: 05/12/98
 Dilution Factor: 1

Work Order #....: CH4N3101
 Prep Date.....: 05/12/98
 Prep Batch #....: 8133164

Matrix.....: WATER

PARAMETER	RESULT	REPORTING			METHOD
		LIMIT	UNITS		
Acetone	ND	10	ug/L		SW846 8260A
Acetonitrile	ND	20	ug/L		SW846 8260A
Acrolein	ND	20	ug/L		SW846 8260A
Acrylonitrile	ND	20	ug/L		SW846 8260A
Allyl chloride	ND	2.0	ug/L		SW846 8260A
Benzene	ND	1.0	ug/L		SW846 8260A
Bromodichloromethane	ND	1.0	ug/L		SW846 8260A
Bromoform	ND	1.0	ug/L		SW846 8260A
Bromomethane	ND	2.0	ug/L		SW846 8260A
2-Butanone (MEK)	ND	10	ug/L		SW846 8260A
Carbon disulfide	ND	1.0	ug/L		SW846 8260A
Carbon tetrachloride	ND	1.0	ug/L		SW846 8260A
Chlorobenzene	ND	1.0	ug/L		SW846 8260A
Chloroethane	ND	2.0	ug/L		SW846 8260A
Chloroform	ND	0.25	ug/L		SW846 8260A
Chloromethane	ND	2.0	ug/L		SW846 8260A
Chloroprene	ND	1.0	ug/L		SW846 8260A
Dibromochloromethane	ND	1.0	ug/L		SW846 8260A
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L		SW846 8260A
1,2-Dibromoethane (EDB)	ND	1.0	ug/L		SW846 8260A
Dibromomethane	ND	1.0	ug/L		SW846 8260A
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L		SW846 8260A
Dichlorodifluoromethane	ND	2.0	ug/L		SW846 8260A
1,1-Dichloroethane	ND	1.0	ug/L		SW846 8260A
1,2-Dichloroethane	ND	1.0	ug/L		SW846 8260A
1,1-Dichloroethene	ND	1.0	ug/L		SW846 8260A
trans-1,2-Dichloroethene	ND	0.50	ug/L		SW846 8260A
1,2-Dichloropropane	ND	1.0	ug/L		SW846 8260A
cis-1,3-Dichloropropene	ND	1.0	ug/L		SW846 8260A
trans-1,3-Dichloropropene	ND	1.0	ug/L		SW846 8260A
Ethylbenzene	ND	1.0	ug/L		SW846 8260A
Ethyl methacrylate	ND	1.0	ug/L		SW846 8260A
2-Hexanone	ND	10	ug/L		SW846 8260A
Iodomethane	ND	1.0	ug/L		SW846 8260A
Isobutyl alcohol	ND	40	ug/L		SW846 8260A
Methacrylonitrile	ND	10	ug/L		SW846 8260A
Methylene chloride	ND	1.0	ug/L		SW846 8260A
Methyl methacrylate	ND	1.0	ug/L		SW846 8260A
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L		SW846 8260A

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METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: A8E060157

Work Order #...: CH4N3101

Matrix.....: WATER

PARAMETER	RESULT	REPORTING		METHOD
		LIMIT	UNITS	
Propionitrile	ND	4.0	ug/L	SW846 8260A
Styrene	ND	1.0	ug/L	SW846 8260A
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A
Tetrachloroethene	ND	1.0	ug/L	SW846 8260A
Toluene	ND	1.0	ug/L	SW846 8260A
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260A
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260A
Trichloroethene	ND	1.0	ug/L	SW846 8260A
Trichlorofluoromethane	ND	2.0	ug/L	SW846 8260A
1,2,3-Trichloropropane	ND	1.0	ug/L	SW846 8260A
Vinyl acetate	ND	2.0	ug/L	SW846 8260A
Vinyl chloride	ND	2.0	ug/L	SW846 8260A
Xylenes (total)	ND	1.0	ug/L	SW846 8260A
m-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A
p-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A
o-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
1,2-Dichloroethane-d4	89	(69 - 127)
Toluene-d8	96	(90 - 112)
Bromofluorobenzene	100	(87 - 114)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: A8E060157
 MB Lot-Sample #: A8E140000-287

Work Order #...: CH6CN101

Matrix.....: WATER

Analysis Date...: 05/14/98
 Dilution Factor: 1

Prep Date.....: 05/14/98
 Prep Batch #...: 8134287

PARAMETER	RESULT	REPORTING		METHOD
		LIMIT	UNITS	
Acetone	ND	10	ug/L	SW846 8260A
Acetonitrile	ND	20	ug/L	SW846 8260A
Acrolein	ND	20	ug/L	SW846 8260A
Acrylonitrile	ND	20	ug/L	SW846 8260A
Allyl chloride	ND	2.0	ug/L	SW846 8260A
Benzene	ND	1.0	ug/L	SW846 8260A
Bromodichloromethane	ND	1.0	ug/L	SW846 8260A
Bromoform	ND	1.0	ug/L	SW846 8260A
Bromomethane	ND	2.0	ug/L	SW846 8260A
2-Butanone (MEK)	ND	10	ug/L	SW846 8260A
Carbon disulfide	ND	1.0	ug/L	SW846 8260A
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260A
Chlorobenzene	ND	1.0	ug/L	SW846 8260A
Chloroethane	ND	2.0	ug/L	SW846 8260A
Chloroform	ND	0.25	ug/L	SW846 8260A
Chloromethane	ND	2.0	ug/L	SW846 8260A
Chloroprene	ND	1.0	ug/L	SW846 8260A
Dibromochloromethane	ND	1.0	ug/L	SW846 8260A
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L	SW846 8260A
1,2-Dibromoethane (EDB)	ND	1.0	ug/L	SW846 8260A
Dibromomethane	ND	1.0	ug/L	SW846 8260A
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L	SW846 8260A
Dichlorodifluoromethane	ND	2.0	ug/L	SW846 8260A
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260A
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260A
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260A
trans-1,2-Dichloroethene	ND	0.50	ug/L	SW846 8260A
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260A
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260A
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260A
Ethylbenzene	ND	1.0	ug/L	SW846 8260A
Ethyl methacrylate	ND	1.0	ug/L	SW846 8260A
2-Hexanone	ND	10	ug/L	SW846 8260A
Iodomethane	ND	1.0	ug/L	SW846 8260A
Isobutyl alcohol	ND	40	ug/L	SW846 8260A
Methacrylonitrile	ND	10	ug/L	SW846 8260A
Methylene chloride	ND	1.0	ug/L	SW846 8260A
Methyl methacrylate	ND	1.0	ug/L	SW846 8260A
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	SW846 8260A

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METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: A8E060157

Work Order #...: CH6CN101

Matrix.....: WATER

PARAMETER	RESULT	REPORTING		METHOD
		LIMIT	UNITS	
Propionitrile	ND	4.0	ug/L	SW846 8260A
Styrene	ND	1.0	ug/L	SW846 8260A
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A
Tetrachloroethene	ND	1.0	ug/L	SW846 8260A
Toluene	ND	1.0	ug/L	SW846 8260A
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260A
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260A
Trichloroethene	ND	1.0	ug/L	SW846 8260A
Trichlorofluoromethane	ND	2.0	ug/L	SW846 8260A
1,2,3-Trichloropropane	ND	1.0	ug/L	SW846 8260A
Vinyl acetate	ND	2.0	ug/L	SW846 8260A
Vinyl chloride	ND	2.0	ug/L	SW846 8260A
Xylenes (total)	ND	1.0	ug/L	SW846 8260A
m-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A
p-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A
o-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
1,2-Dichloroethane-d4	88	(69 - 127)
Toluene-d8	98	(90 - 112)
Bromofluorobenzene	92	(87 - 114)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #....: A8E060157
MB Lot-Sample #: A8E080000-110
Analysis Date...: 05/27/98
Dilution Factor: 1

Work Order #....: CH1HH101
Prep Date.....: 05/08/98
Prep Batch #....: 8128110

Matrix.....: WATER

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Hexachlorobenzene	ND	0.050	ug/L	SW846 8081A
<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>		
Tetrachloro-m-xylene	50	(10 - 130)		
Decachlorobiphenyl	67	(10 - 116)		

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E060157
MB Lot-Sample #: A8E120000-107

Work Order #...: CH3NF101

Matrix.....: SOLID

Analysis Date...: 06/03/98
Dilution Factor: 1

Prep Date.....: 05/12/98

Prep Batch #...: 8132107

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Hexachlorobenzene	ND	3.3	ug/kg	SW846 8081A
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>		
Tetrachloro-m-xylene	98	(8.0- 129)		
Decachlorobiphenyl	188 *	(0.0- 138)		

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

* Surrogate recovery is outside stated control limits.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E060157
MB Lot-Sample #: A8E080000-113

Work Order #...: CH1HX101

Matrix.....: WATER

Analysis Date...: 05/27/98
Dilution Factor: 1

Prep Date.....: 05/08/98
Prep Batch #...: 8128113

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u>		<u>METHOD</u>
		<u>LIMIT</u>	<u>UNITS</u>	
Aroclor 1016	ND	1.0	ug/L	SW846 8082
Aroclor 1221	ND	1.0	ug/L	SW846 8082
Aroclor 1232	ND	1.0	ug/L	SW846 8082
Aroclor 1242	ND	1.0	ug/L	SW846 8082
Aroclor 1248	ND	1.0	ug/L	SW846 8082
Aroclor 1254	ND	1.0	ug/L	SW846 8082
Aroclor 1260	ND	1.0	ug/L	SW846 8082
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>		
Tetrachloro-m-xylene	84	(10 - 130)		
Decachlorobiphenyl	90	(10 - 116)		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E060157
MB Lot-Sample #: A8E130000-101

Work Order #...: CH4JD101

Matrix.....: SOLID

Analysis Date...: 05/20/98

Prep Date.....: 05/13/98

Prep Batch #...: 8133101

Dilution Factor: 1

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	33	ug/kg	SW846 8082
Aroclor 1232	ND	33	ug/kg	SW846 8082
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>		
Tetrachloro-m-xylene	85	(8.0- 129)		
Decachlorobiphenyl	93	(0.0- 138)		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #....: A8E060157
 MB Lot-Sample #: A8E120000-108
 Analysis Date...: 05/27/98
 Dilution Factor: 1

Work Order #....: CH3NG101
 Prep Date.....: 05/12/98
 Prep Batch #....: 8132108

Matrix.....: SOLID

		REPORTING		
<u>PARAMETER</u>	<u>RESULT</u>	<u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	33	ug/kg	SW846 8082
Aroclor 1232	ND	33	ug/kg	SW846 8082
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>		
Tetrachloro-m-xylene	82	(8.0- 129)		
Decachlorobiphenyl	93	(0.0- 138)		

TE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: A8E060157

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: A8E120000-253 Prep Batch #...: 8132253						
Arsenic	ND	5.0	ug/L	SW846 6010A	05/13-05/18/98	CH4EA102
		Dilution Factor: 1				
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH4EA101
		Dilution Factor: 1				

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #....: A8E060157

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
MB Lot-Sample #: A8E150000-119 Prep Batch #....: 8135119						
Arsenic	ND	1000	ug/kg	SW846 6010A	05/15-05/18/98	CH6F4103
		Dilution Factor: 1				
Cobalt	ND	5000	ug/kg	SW846 6010A	05/15-05/18/98	CH6F4101
		Dilution Factor: 1				

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

General Chemistry

Client Lot #....: A8E060157

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	ND	0.10	%	MB Lot-Sample #: A8E070000-137 MCAWW 160.3 MOD	05/07-05/08/98	8127137
Dilution Factor: 1						
Percent Solids	ND	0.10	%	MB Lot-Sample #: A8E070000-139 MCAWW 160.3 MOD	05/07-05/08/98	8127139
Dilution Factor: 1						

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

General Chemistry

Client Lot #....: A8E060157

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	Work Order #: CH74N101 5.0	ug/L	MB Lot-Sample #: SW846 9012	A8E150000-242 05/15-05/18/98	8135242

Dilution Factor: 1

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: A8E060157 Work Order #...: CGXGM102-MS Matrix.....: WATER
 MS Lot-Sample #: A8E060111-002 CGXGM103-MSD
 Date Sampled...: 05/05/98 14:30 Date Received...: 05/06/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/12/98
 Prep Batch #...: 8133164
 Dilution Factor: 100

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
1,1-Dichloroethene	104	(75 - 113)			SW846 8260A
	108	(75 - 113)	3.8	(0-20)	SW846 8260A
Trichloroethene	95	(71 - 110)			SW846 8260A
	97	(71 - 110)	2.3	(0-22)	SW846 8260A
Chlorobenzene	102	(81 - 115)			SW846 8260A
	106	(81 - 115)	3.8	(0-18)	SW846 8260A
Toluene	104	(78 - 126)			SW846 8260A
	110	(78 - 126)	5.1	(0-24)	SW846 8260A
Benzene	101	(78 - 117)			SW846 8260A
	109	(78 - 117)	2.6	(0-17)	SW846 8260A

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	94	(69 - 127)
	87	(69 - 127)
Toluene-d8	100	(90 - 112)
	101	(90 - 112)
Bromofluorobenzene	100	(87 - 114)
	102	(87 - 114)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: A8E060157 Work Order #...: CH3A2104-MS Matrix.....: WATER
 MS Lot-Sample #: A8E110118-003 CH3A2105-MSD
 Date Sampled...: 05/08/98 10:26 Date Received...: 05/09/98
 Prep Date.....: 05/14/98 Analysis Date...: 05/14/98
 Prep Batch #...: 8134287
 Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
1,1-Dichloroethene	96	(75 - 113)			SW846 8260A
	94	(75 - 113)	2.1	(0-20)	SW846 8260A
Trichloroethene	98	(71 - 110)			SW846 8260A
	97	(71 - 110)	1.2	(0-22)	SW846 8260A
Chlorobenzene	103	(81 - 115)			SW846 8260A
	102	(81 - 115)	1.4	(0-18)	SW846 8260A
Toluene	97	(78 - 126)			SW846 8260A
	94	(78 - 126)	2.3	(0-24)	SW846 8260A
Benzene	94	(78 - 117)			SW846 8260A
	93	(78 - 117)	1.3	(0-17)	SW846 8260A

PROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Dichloroethane-d4	87	(69 - 127)
	81	(69 - 127)
Toluene-d8	94	(90 - 112)
	95	(90 - 112)
Bromofluorobenzene	85 *	(87 - 114)
	82 *	(87 - 114)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

- * Surrogate recovery is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E060157 Work Order #....: CGXX9102-MS Matrix.....: WATER
 MS Lot-Sample #: A8E060157-003 CGXX9103-MSD
 Date Sampled....: 05/04/98 18:39 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/27/98
 Prep Batch #....: 8128110
 Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Lindane	81	(48 - 135)			SW846 8081A
	82	(48 - 135)	1.2	(0-51)	SW846 8081A
Heptachlor	89	(56 - 158)			SW846 8081A
	90	(56 - 158)	2.0	(0-36)	SW846 8081A
Aldrin	72	(54 - 120)			SW846 8081A
	70	(54 - 120)	2.8	(0-40)	SW846 8081A
Dieldrin	96	(54 - 143)			SW846 8081A
	97	(54 - 143)	0.51	(0-32)	SW846 8081A
Endrin	72	(64 - 142)			SW846 8081A
	25 a,p	(64 - 142)	98	(0-39)	SW846 8081A
4,4'-DDT	92	(48 - 154)			SW846 8081A
	91	(48 - 154)	1.4	(0-47)	SW846 8081A

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	55	(10 - 130)
	58	(10 - 130)
Decachlorobiphenyl	67	(10 - 116)
	70	(10 - 116)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

a Spiked analyte recovery is outside stated control limits.

p Relative percent difference (RPD) is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH00K106-MS Matrix.....: SOLID
 MS Lot-Sample #: A8E060157-019 CH00K107-MSD
 Date Sampled...: 05/05/98 14:40 Date Received...: 05/06/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/29/98
 Prep Batch #...: 8132107
 Dilution Factor: 1 % Moisture.....: 13

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Lindane	70	(28 - 125)			SW846 8081A
	75	(28 - 125)	6.6	(0-51)	SW846 8081A
Heptachlor	78	(24 - 168)			SW846 8081A
	78	(24 - 168)	0.38	(0-73)	SW846 8081A
Aldrin	66	(31 - 123)			SW846 8081A
	62	(31 - 123)	6.1	(0-42)	SW846 8081A
Dieldrin	80	(32 - 145)			SW846 8081A
	84	(32 - 145)	5.1	(0-43)	SW846 8081A
Endrin	83	(32 - 137)			SW846 8081A
	85	(32 - 137)	2.1	(0-45)	SW846 8081A
4,4'-DDT	90	(10 - 151)			SW846 8081A
	107	(10 - 151)	17	(0-50)	SW846 8081A

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	54	(8.0- 129)
	54	(8.0- 129)
Decachlorobiphenyl	107	(0.0- 138)
	108	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Results and reporting limits have been adjusted for dry weight.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH00X106-MS Matrix.....: SOLID
 MS Lot-Sample #: A8E060157-022 CH00X107-MSD
 Date Sampled...: 05/04/98 15:55 Date Received...: 05/06/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/29/98
 Prep Batch #...: 8132107
 Dilution Factor: 1 % Moisture.....: 8.7

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Lindane	44	(28 - 125)			SW846 8081A
	62	(28 - 125)	33	(0-51)	SW846 8081A
Heptachlor	61	(24 - 168)			SW846 8081A
	78	(24 - 168)	24	(0-73)	SW846 8081A
Aldrin	55	(31 - 123)			SW846 8081A
	62	(31 - 123)	13	(0-42)	SW846 8081A
Dieldrin	60	(32 - 145)			SW846 8081A
	81	(32 - 145)	30	(0-43)	SW846 8081A
Endrin	70	(32 - 137)			SW846 8081A
	87	(32 - 137)	22	(0-45)	SW846 8081A
4,4'-DDT	68	(10 - 151)			SW846 8081A
	84	(10 - 151)	21	(0-50)	SW846 8081A

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	52	(8.0- 129)
	57	(8.0- 129)
Decachlorobiphenyl	100	(0.0- 138)
	108	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Results and reporting limits have been adjusted for dry weight.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E060157 Work Order #....: CGXXT104-MS Matrix.....: WATER
 MS Lot-Sample #: A8E060157-012 CGXXT105-MSD
 Date Sampled...: 05/05/98 08:45 Date Received...: 05/06/98
 Prep Date.....: 05/08/98 Analysis Date...: 05/27/98
 Prep Batch #....: 8128113
 Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Aroclor 1016	83	(42 - 136)			SW846 8082
	83	(42 - 136)	0.06	(0-29)	SW846 8082
Aroclor 1260	90	(42 - 136)			SW846 8082
	89	(42 - 136)	1.0	(0-29)	SW846 8082

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	88	(10 - 130)
	89	(10 - 130)
Decachlorobiphenyl	98	(10 - 116)
	97	(10 - 116)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH00G106-MS Matrix.....: SOLID
 MS Lot-Sample #: A8E060157-018 CH00G107-MSD
 Date Sampled...: 05/05/98 13:55 Date Received...: 05/06/98
 Prep Date.....: 05/13/98 Analysis Date...: 06/02/98
 Prep Batch #...: 8133101
 Dilution Factor: 20 % Moisture.....: 16

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Aroclor 1016	114 DIL	(44 - 139)			SW846 8082
	109 DIL	(44 - 139)	4.5	(0-28)	SW846 8082
Aroclor 1260	129 DIL	(44 - 139)			SW846 8082
	132 DIL	(44 - 139)	2.2	(0-28)	SW846 8082

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	126 DIL	(8.0- 129)
	118 DIL	(8.0- 129)
Decachlorobiphenyl	191	(0.0- 138)
	Qualifiers: DIL, *	
	206	(0.0- 138)
	Qualifiers: DIL, *	

NOTE(S) :

- Calculations are performed before rounding to avoid round-off errors in calculated results.
- Bold print denotes control parameters
- DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.
- Results and reporting limits have been adjusted for dry weight.
- * Surrogate recovery is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E060157 Work Order #....: CH00K103-MS Matrix.....: SOLID
 MS Lot-Sample #: A8E060157-019 CH00K104-MSD
 Date Sampled....: 05/05/98 14:40 Date Received...: 05/06/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/27/98
 Prep Batch #....: 8132108
 Dilution Factor: 2 % Moisture.....: 13

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Aroclor 1016	102	(44 - 139)			SW846 8082
	95	(44 - 139)	7.3	(0-28)	SW846 8082
Aroclor 1260	88	(44 - 139)			SW846 8082
	105	(44 - 139)	18	(0-28)	SW846 8082

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	124	(8.0- 129)
	102	(8.0- 129)
Decachlorobiphenyl	95	(0.0- 138)
	124	(0.0- 138)

RE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Results and reporting limits have been adjusted for dry weight.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E060157 Work Order #....: CH00X104-MS Matrix.....: SOLID
 MS Lot-Sample #: A8E060157-022 CH00X105-MSD
 Date Sampled....: 05/04/98 15:55 Date Received...: 05/06/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/27/98
 Prep Batch #....: 8132108
 Dilution Factor: 2 % Moisture.....: 8.7

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Aroclor 1016	75	(44 - 139)			SW846 8082
	94	(44 - 139)	21	(0-28)	SW846 8082
Aroclor 1260	75	(44 - 139)			SW846 8082
	97	(44 - 139)	25	(0-28)	SW846 8082

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	78	(8.0- 129)
	95	(8.0- 129)
Decachlorobiphenyl	90	(0.0- 138)
	100	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Results and reporting limits have been adjusted for dry weight.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...: A8E060157 Work Order #...: CH02L109-MS Matrix.....: SOLID
 MS Lot-Sample #: A8E060157-028 CH02L10A-MSD
 Date Sampled...: 05/04/98 19:20 Date Received...: 05/06/98
 Prep Date.....: 05/13/98 Analysis Date...: 05/25/98
 Prep Batch #...: 8133101
 Dilution Factor: 1 % Moisture.....: 16

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Aroclor 1016	96	(44 - 139)			SW846 8082
	97	(44 - 139)	1.1	(0-28)	SW846 8082
Aroclor 1260	100	(44 - 139)			SW846 8082
	101	(44 - 139)	0.11	(0-28)	SW846 8082

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	111	(8.0- 129)
	109	(8.0- 129)
Decachlorobiphenyl	111	(0.0- 138)
	105	(0.0- 138)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

Results and reporting limits have been adjusted for dry weight.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: A8E060157

Matrix.....: WATER

Date Sampled...: 05/05/98 08:45 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8E060157-012 Prep Batch #...: 8132253							
Arsenic	93	(80 - 120)			SW846 6010A	05/13-05/18/98	CGXXT108
	92	(80 - 120)	0.90	(0-20)	SW846 6010A	05/13-05/18/98	CGXXT109
		Dilution Factor: 1					
Cobalt	97	(80 - 120)			SW846 6010A	05/13-05/18/98	CGXXT106
	96	(80 - 120)	0.96	(0-20)	SW846 6010A	05/13-05/18/98	CGXXT107
		Dilution Factor: 1					

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E060157

Matrix.....: SOLID

Date Sampled....: 05/05/98 13:55 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8E060157-018 Prep Batch #....: 8135119							
Arsenic	81	(80 - 120)			SW846 6010A	05/15-05/18/98	CH00G109
	81	(80 - 120)	0.12	(0-20)	SW846 6010A	05/15-05/18/98	CH00G10A
		Dilution Factor: 1					
Cobalt	109	(80 - 120)			SW846 6010A	05/15-05/18/98	CH00G104
	48 N,*	(80 - 120)	36	(0-20)	SW846 6010A	05/15-05/18/98	CH00G105
		Dilution Factor: 1					

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

N Spiked analyte recovery is outside stated control limits.

* Relative percent difference (RPD) is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E060157

Matrix.....: SOLID

Date Sampled....: 05/04/98 19:20 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8E060157-028 Prep Batch #....: 8135119							
Arsenic	84	(80 - 120)			SW846 6010A	05/15-05/18/98	CH02L105
	84	(80 - 120)	0.51	(0-20)	SW846 6010A	05/15-05/18/98	CH02L106
		Dilution Factor: 1					
Cobalt	92	(80 - 120)			SW846 6010A	05/15-05/18/98	CH02L107
	95	(80 - 120)	3.1	(0-20)	SW846 6010A	05/15-05/18/98	CH02L108
		Dilution Factor: 1					

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #....: A8E060157

Work Order #....: CGWM7-SMP
CGWM7-DUP

Matrix.....: SOLID

Date Sampled....: 05/03/98 09:45 Date Received...: 05/06/98

% Moisture.....: 15

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	84.7	84.6	%	0.11	(0-20)	SD Lot-Sample #: A8E050103-003 MCAWW 160.3 MOD	05/07-05/08/98	8127137

Dilution Factor: 1

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
Results and reporting limits have been adjusted for dry weight.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #....: A8E060157

Work Order #....: CGWM8-SMP
CGWM8-DUP

Matrix.....: SOLID

Date Sampled....: 05/03/98 11:20 Date Received...: 05/06/98

% Moisture.....: 20

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	80.5	80.5	%	0.057	(0-20)	MCAWW 160.3 MOD	05/07-05/08/98	8127137

Dilution Factor: 1

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: A8E060157

Work Order #...: CH00C-SMP
CH00C-DUP

Matrix.....: SOLID

Date Sampled...: 05/05/98 11:00 Date Received...: 05/06/98

% Moisture.....: 9.1

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	90.9	91.1	%	0.24	(0-20)	SD Lot-Sample #: A8E060157-016 MCAWW 160.3 MOD	05/07-05/08/98	8127139

Dilution Factor: 1

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: A8E060157

Work Order #...: CH02L-SMP
CH02L-DUP

Matrix.....: SOLID

Date Sampled...: 05/04/98 19:20 Date Received...: 05/06/98

% Moisture.....: 16

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	83.6	81.8	%	2.2	(0-20)	SD Lot-Sample #: A8E060157-028 MCAWW 160.3 MOD	05/07-05/08/98	8127139

Dilution Factor: 1

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

Chain of Custody Record

QUA-4149-1

QUA-4149-1		Project Manager		Date	Page 1 of 1	
Client		John Hunter		May 4, 1998		
Address		Telephone Number (Area Code)/Fax Number		Lab Location	Analysis	
3M Company		(612) 778-5388		Quantana - North Canton		
935 Bush Ave.						
City	State	Zip Code	Site Contact			
St. Paul	MN	55144-1000	Carol Snyder			
Project Number/Name			Carrier/Waybill Number			
CORDOVA RFI MAY 1998			FedEx: 8005 4025 2024			
Contract/Purchase Order/Quote Number						

Sample I.D. Number and Description	Date	Time	Sample Type	Containers			Preservative	Condition on Receipt/Comments	HCE	YOC	Total
				Volume	Type	No.					
Field Blank 1	5/4/98	13:04	Water	1 Liter	Amber	2	None		X		
EQUIPMENT BLANK 1	5/4/98	16:02	↓	1 Liter	Amber	2	None		X		
	↓	↓		cut 250 ml	plastic	1	NaOH	Hold		X	
				40 ml	GLASS	3	HCl	Hold			
				1 Liter	Amber	2	None		X		
RFI - I (RES) MW5-90	5/4/98	18:39	↓	1 Liter	Amber	2	None		X		
RFI - I (RES) MW5-90 Hs/Med	5/4/98	18:39		Water	1 Liter	Amber	2	None		X	
RFI - I (RES) MW4-90	5/5/98	9:17								X	
RFI - I (RES) MW1-94	5/5/98	12:14								X	
RFI - I (RES) MW2-94	5/5/98	13:52								X	
RFI - I (RES) MW7-94	5/5/98	14:55								X	
EQUIPMENT BLANK #2	5/5/98	15:26								X	
FIELD BLANK #2	5/5/98	16:50								X	
FIELD DUPLICATE #1	5/4/98	18:39									
TRIP BLANK					40 ml	GLASS	3	HCl			X
TEMP BLANK			↓		PLASTIC	1	None	For TEMPERATURE only			

Special Instructions

Special Instructions
Call Cathy Lunsom 612-551-2474 or Carol Snyder w/ questions
Sample Disposal

Possible Hazard Identification

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

(A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required

☒ Normal ☐ Rush ☐ Other

OG Level As per Worksheet

☐ I. ☐ II. ☐ III.

Project Specific Requirements (Specify)

1. Relinquished By

1. Hennig (1950)

Date	Time
5/5/98	17:20

1. Received By	
----------------	--

Date	Time
------	------

2. Relinquished By

Date	Time
------	------

2. Received By

Date	Time
------	------

3. Relinquished By

Date	Time
------	------

3. Received By

Date	Time
5-6-98	1130

Comments

Comments
Custody seals: 039125 & 039130

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Chain of Study Record

Seals: 0391 + 039115

WALCH

QUA-4149-1

Client 3M Company - Cordova			Project Manager John Hunter			Date May 5, 1998			Page 1 of 1		
Address 935 Bush Avenue			Telephone Number (Area Code)/Fax Number 612-778-5388			Lab Location Quanta - N. Canton			Analysis		
City St. Paul	State MN	Zip Code 55144-1000	Site Contact Carol Snyder								
Project Number/Name Cordova RFI - May 1998			Carrier/Waybill Number Fed Ex: 8005-4025-2002								
Contract/Purchase Order/Quote Number 102801 / 10100											

Sample I.D. Number and Description	Date	Time	Sample Type	Containers			Preservative	Condition on Receipt/Comments	As Co 6010A (trace)	HCB 8080A	PCR 8080A	Co 6010A (trace)	To Temp Measure										
				Volume	Type	No.																	
✓ Temperature Blank SS-5/5	5-5-98	-	Water	-	-	-	-																
✓ Field Blank 7		0845	Water	1 liter	Plastic	1	HNO ₃		X														
✓ " "		0845	Water	1 liter	Glass	2	None		X	X													
✓ Equipment Blank 4		0900	Water	1 liter	Plastic	1	HNO ₃		X														
✓ " "		0900	Water	1 liter	Glass	2	None		X	X													
✓ RFI-1 (RES) SS-25		0945	Soil	120 ml	Glass	3	None		X	X													
✓ RFI-1 (RES) SS-26		1020	↓	↓	↓	↓	↓		X	X													
✓ RFI-1 (RES) SS-27		1100	↓	↓	↓	↓	↓		X	X													
✓ Field Blank 8		1340	Water	1 liter	Plastic	1	HNO ₃		X														
✓ " "		1340	Water	1 liter	Glass	2	None		X	X													
✓ RFI-1 (RES) SS-20		1355	Soil	120 ml	Glass	3	None		X	X													
✓ RFI-1 (RES) SS-20 MS/MSD6		1355	↓	↓	↓	↓	↓		X	X													
✓ RFI-1 (RES) SS-7		1440	↓	↓	↓	↓	↓		X	X													
✓ RFI-1 (RES) SS-7 MS/MSD7		1440	↓	↓	↓	↓	↓		X	X													
✓ RFI-1 (RES) SS-21		1545	↓	↓	↓	↓	↓		X	X													

Special Instructions

Call Cathy Larson 612-551-2474 OR Carol Snyder w/questions

Possible Hazard Identification				Sample Disposal				(A fee may be assessed if samples are retained longer than 3 months)			
<input checked="" type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown	<input type="checkbox"/> Return To Client	<input checked="" type="checkbox"/> Disposal By Lab	<input type="checkbox"/> Archive For	Months			
Turn Around Time Required				QC Level				Project Specific Requirements (Specify)			
<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Rush	<input checked="" type="checkbox"/> Other	305/5		<input type="checkbox"/> I.	<input type="checkbox"/> II.	<input type="checkbox"/> III.	See 3M-Cordova QAPP for TAT / QC Level etc			
1. Relinquished By				Date				1. Received By			
[Signature]				5/5/98 1700				[Signature]			
2. Relinquished By				Date				2. Received By			
[Signature]											
3. Relinquished By				Date				3. Received By			
[Signature]								5-6-98 1130A			

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Chain of Custody Record



QUA-4149-1

Client 3M Company		Project Manager John Hunter		Date MAY 4, 1998	Page 1 of 1
Address 935 Bush Ave.		Telephone Number (Area Code)/Fax Number (612) 778-5388		Lab Location Quanterra-North Canton	Analysis
City St. Paul	State MN	Zip Code 55144-1000	Site Contact Carol Snyder		
Project Number/Name CONDORA RFI MAY 1998			Carrier/Waybill Number Fid Ex: 8005-4025-2002		
Contract/Purchase Order/Quote Number 102801 / 10100					

Sample I.D. Number and Description	Date	Time	Sample Type	Containers			Preservative	Condition on Receipt/Comments	AS Co CONDORA RFI MAY 1998	H/C/PAK 3080A	A/B 9080A	T ^o Temp Blank
				Volume	Type	No.						
Field Blank 6	5/4/98	1440	WATER	1 Liter	plastic	1	HNO3		X	X	X	
↓	5/4/98	1450	↓	1 Liter	plastic	2	None		X	X	X	
RFI-I (RES) SS-1	5/4	1555	Soil	120 ml	glass	3	None		X	X	X	
RFI-I (RES) SS-28		1710							X	X	X	
RFI-I (RES) SS-22		1830							X	X	X	
RFI-I (RES) SS-23 ①		1750							X	X	X	
Field Duplicate 5		1555							X	X	X	
Field Duplicate 6	5/4	1710							X	X	X	
ASTMSD 4 (SS) 5/4		1555							X	X	X	
ASTMSD 5 (SS) 5/4		1710							X	X	X	
RFI-I (RES) SS-21 MS/MSD 4	5/5/98	1710							X	X	X	
RFI-I (RES) SS-24 MS/MSD 5	5/5								X	X	X	
RFI-I (RES) SS-24	5-4-98	1920	Soil ④	120 ml	Glass	3	None		X	X	X	
Temperature Blank SS-5/4	5-4-98	-	Water	-	-	1	-	For Temp measure only				X

Special Instructions
Call Cathy Larson 612-551-2474 or Carol Snyder w/ questions

Possible Hazard Identification
☒ Non-Hazard
☐ Flammable
☐ Skin Irritant
☐ Poison B
☐ Unknown
☐ Return To Client
☐ Disposal By Lab
☐ Archive For _____ Months

Turn Around Time Required
☒ Normal
☐ Rush
☐ Other _____

QC Level
☐ I. ☐ II. ☐ III.

Project Specific Requirements (Specify)
See QAPP

1. Relinquished By	Date	Time	1. Received By	Date	Time
<i>[Signature]</i>	5/5/98	0730	<i>[Signature]</i>	5/5/98	0730
2. Relinquished By	Date	Time	2. Received By	Date	Time
<i>[Signature]</i>	5/5/98	17:20	<i>[Signature]</i>	5/5/98	1720
3. Relinquished By	Date	Time	3. Received By	Date	Time
<i>[Signature]</i>	5/5/98	17:50	<i>[Signature]</i>	5-6-98	1136A

Comments
Custody Seals: 042696 & 042701

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

④ Temp Blank SS-5/4
③ One of Jars had 1 water in bag
② Per Project Work Plan / QAPP

CORDOVA RFI

**MAY 1998
ANALYTICAL REPORT**

LOT #: A8E080133

Quanterra Incorporated
4101 Shuffel Drive, NW
North Canton, Ohio 44720

330 497-9396 Telephone
330 497-0772 Fax

ANALYTICAL REPORT

CORDOVA RFI MAY 1998

Lot #: A8E080133

Carol Snyder

3M Company

QUANTERRA INCORPORATED



Jeffrey C. Smith
Project Manager

June 15, 1998

CASE NARRATIVE

The following report contains the analytical results for eight water samples and seven solid samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were received May 7, 1998 according to documented sample acceptance procedures.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder on June 4, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

Samples submitted for Total and Amenable Cyanide were placed in archive per the chain-of-custody.

The coolers were received at the laboratory at temperatures of 1.6, 2.4 and 1.6° C.

SUPPLEMENTAL QC INFORMATION

GC SEMIVOLATILES – Organochlorine Pesticides

Samples RFI-I (RES) SS-4, Field Duplicate #7 and RFI-I (RES) SS-2 were diluted due to matrix effects and was ND; therefore, the detection limits were elevated.

GC SEMIVOLATILES – Polychlorinated Biphenyls

Samples RFI-I (RES) SS-15, RFI-I (RES) SS-4, Field Duplicate #7, RFI-I (RES) SS-19, RFI-I (RES) SS-2, RFI-I (RES) SS-11 and RFI-I (RES) SS-10 were diluted due to matrix effects and was ND; therefore, the detection limits were elevated.

METALS

There is the possibility of false positive results when reporting down to the Method Detection Limit (MDL). The acceptance criteria for ICB, CCB, and Method Blank is \pm the RL.

SAMPLE SUMMARY

A8E080133

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CH1TE	001	RFI-I (RES) MW2-90	05/07/98	09:40
CH1TP	002	RFI-I (RES) MW1-90	05/07/98	10:59
CH1TQ	003	RFI-I (RES) MW5-94	05/07/98	12:44
CH1TR	004	RFI-I (RES) MW6-94	05/07/98	13:43
CH1TT	005	FIELD BLANK #4	05/07/98	13:59
CH1TV	006	RFI-I (RES) MW3-90	05/07/98	15:52
CH1TW	007	RFI-I (RES) SS-15	05/07/98	08:45
CH1TX	008	RFI-I (RES) SS-4	05/07/98	09:15
CH1V0	009	FIELD DUPLICATE #7	05/07/98	09:15
CH1V2	010	RFI-I (RES) SS-19	05/07/98	11:00
CH1V3	011	RFI-I (RES) SS-2	05/07/98	11:30
CH1V4	012	FIELD BLANK #10	05/07/98	13:20
CH1V6	013	EQUIPMENT BLANK #5	05/07/98	13:45
CH1V8	014	RFI-I (RES) SS-11	05/07/98	14:10
CH1V9	015	RFI-I (RES) SS-10	05/07/98	15:30

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

ANALYTICAL METHODS SUMMARY

A8E080133

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>
Inductively Coupled Plasma (ICP) Metals	SW846 6010A
Organochlorine Pesticides	SW846 8081A
PCBs	SW846 8082
Total Residue as Percent Solids	MCAWW 160.3 MOD
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010A

References:

- MCAWW "Methods for Chemical Analysis of Water and Wastes",
EPA-600/4-79-020, March 1983 and subsequent revisions.
- SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical
Methods", Third Edition, November 1986 and its updates.

3M COMPANY

Client Sample ID: RFI-I (RES) MW2-90

GC Semivolatiles

Lot-Sample #...: A8E080133-001 Work Order #...: CH1TE101 Matrix.....: WATER
 Date Sampled...: 05/07/98 09:40 Date Received...: 05/08/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #...: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	53	(10 - 130)
Decachlorobiphenyl	61	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW1-90

GC Semivolatiles

Lot-Sample #...: A8E080133-002 Work Order #...: CH1TP101 Matrix.....: WATER
 Date Sampled...: 05/07/98 10:59 Date Received...: 05/08/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #...: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	49	(10 - 130)
Decachlorobiphenyl	64	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW5-94

GC Semivolatiles

Lot-Sample #....: A8E080133-003 Work Order #....: CH1TQ101 Matrix.....: WATER
 Date Sampled....: 05/07/98 12:44 Date Received...: 05/08/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	41	(10 - 130)
Decachlorobiphenyl	50	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW6-94

GC Semivolatiles

Lot-Sample #....: A8E080133-004 Work Order #....: CH1TR101 Matrix.....: WATER
 Date Sampled....: 05/07/98 13:43 Date Received...: 05/08/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	51	(10 - 130)
Decachlorobiphenyl	65	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK #4

GC Semivolatiles

Lot-Sample #....: A8E080133-005 Work Order #....: CH1TT101 Matrix.....: WATER
 Date Sampled....: 05/07/98 13:59 Date Received...: 05/08/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	51	(10 - 130)
Decachlorobiphenyl	55	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW3-90

GC Semivolatiles

Lot-Sample #....: A8E080133-006 Work Order #....: CH1TV101 Matrix.....: WATER
 Date Sampled....: 05/07/98 15:52 Date Received...: 05/08/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	57	(10 - 130)
Decachlorobiphenyl	49	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) SS-15

GC Semivolatiles

Lot-Sample #....: A8E080133-007 Work Order #....: CH1TW103 Matrix.....: SOLID
Date Sampled....: 05/07/98 08:45 Date Received...: 05/08/98
Prep Date.....: 05/14/98 Analysis Date...: 06/02/98
Prep Batch #....: 8134157
Dilution Factor: 20
% Moisture.....: 14 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	760	ug/kg
Aroclor 1221	ND	760	ug/kg
Aroclor 1232	ND	760	ug/kg
Aroclor 1242	ND	760	ug/kg
Aroclor 1248	ND	760	ug/kg
Aroclor 1254	ND	760	ug/kg
Aroclor 1260	ND	760	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	109 DIL	(8.0- 129)
Decachlorobiphenyl	346 DIL, *	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-15

TOTAL Metals

Lot-Sample #...: A8E080133-007

Matrix.....: SOLID

Date Sampled...: 05/07/98 08:45 Date Received...: 05/08/98

% Moisture.....: 14

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...	8141113					
Cobalt	180000	5790	ug/kg	SW846 6010A	05/21-05/29/98	CH1TW102
Dilution Factor: 1						

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-4

GC Semivolatiles

Lot-Sample #....: A8E080133-008 Work Order #....: CH1TX103 Matrix.....: SOLID
Date Sampled....: 05/07/98 09:15 Date Received...: 05/08/98
Prep Date.....: 05/12/98 Analysis Date...: 06/03/98
Prep Batch #....: 8132107
Dilution Factor: 20
% Moisture.....: 17 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	80	ug/kg

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	0.0 DIL, *	(8.0- 129)
Decachlorobiphenyl	0.0 DIL	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-4

GC Semivolatiles

Lot-Sample #....: A8E080133-008 Work Order #....: CH1TX102 Matrix.....: SOLID
Date Sampled....: 05/07/98 09:15 Date Received...: 05/08/98
Prep Date.....: 05/12/98 Analysis Date...: 06/02/98
Prep Batch #....: 8132108
Dilution Factor: 20
% Moisture.....: 17 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	800	ug/kg
Aroclor 1221	ND	800	ug/kg
Aroclor 1232	ND	800	ug/kg
Aroclor 1242	ND	800	ug/kg
Aroclor 1248	ND	800	ug/kg
Aroclor 1254	ND	800	ug/kg
Aroclor 1260	ND	800	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	107 DIL	(8.0- 129)
Decachlorobiphenyl	169 DIL, *	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: FIELD DUPLICATE #7

GC Semivolatiles

Lot-Sample #...: A8E080133-009 Work Order #...: CH1V0102 Matrix.....: SOLID
Date Sampled...: 05/07/98 09:15 Date Received...: 05/08/98
Prep Date.....: 05/12/98 Analysis Date...: 06/03/98
Prep Batch #...: 8132107
Dilution Factor: 20
% Moisture.....: 14 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	76	ug/kg

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	0.0 DIL, *	(8.0- 129)
Decachlorobiphenyl	0.0 DIL	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: FIELD DUPLICATE #7

GC Semivolatiles

Lot-Sample #....: A8E080133-009 Work Order #....: CH1V0103 Matrix.....: SOLID
Date Sampled....: 05/07/98 09:15 Date Received...: 05/08/98
Prep Date.....: 05/12/98 Analysis Date...: 06/02/98
Prep Batch #....: 8132108
Dilution Factor: 20
% Moisture.....: 14 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	760	ug/kg
Aroclor 1221	ND	760	ug/kg
Aroclor 1232	ND	760	ug/kg
Aroclor 1242	ND	760	ug/kg
Aroclor 1248	ND	760	ug/kg
Aroclor 1254	ND	760	ug/kg
Aroclor 1260	ND	760	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	100 DIL	(8.0- 129)
Decachlorobiphenyl	190 DIL, *	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-19

GC Semivolatiles

Lot-Sample #....: A8E080133-010 Work Order #....: CH1V2103 Matrix.....: SOLID
Date Sampled....: 05/07/98 11:00 Date Received...: 05/08/98
Prep Date.....: 05/14/98 Analysis Date...: 06/02/98
Prep Batch #....: 8134157
Dilution Factor: 20
% Moisture.....: 15 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING	
		LIMIT	UNITS
Aroclor 1016	ND	780	ug/kg
Aroclor 1221	ND	780	ug/kg
Aroclor 1232	ND	780	ug/kg
Aroclor 1242	ND	780	ug/kg
Aroclor 1248	ND	780	ug/kg
Aroclor 1254	ND	780	ug/kg
Aroclor 1260	ND	780	ug/kg

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
Tetrachloro-m-xylene	98 DIL	(8.0- 129)
Decachlorobiphenyl	153 DIL, *	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-19

TOTAL Metals

Lot-Sample #....: A8E080133-010

Date Sampled....: 05/07/98 11:00 Date Received...: 05/08/98

% Moisture.....: 15

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8141113						
Cobalt	87400	5890	ug/kg	SW846 6010A	05/21-05/29/98	CHIV2102
Dilution Factor: 1						

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-2

GC Semivolatiles

Lot-Sample #....: A8E080133-011 Work Order #....: CH1V3103 Matrix.....: SOLID
Date Sampled....: 05/07/98 11:30 Date Received...: 05/08/98
Prep Date.....: 05/12/98 Analysis Date...: 06/03/98
Prep Batch #....: 8132107
Dilution Factor: 20
% Moisture.....: 17 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	79	ug/kg

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	0.0 DIL, *	(8.0- 129)
Decachlorobiphenyl	0.0 DIL	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-2

GC Semivolatiles

Lot-Sample #....: A8E080133-011 Work Order #....: CH1V3102 Matrix.....: SOLID
Date Sampled....: 05/07/98 11:30 Date Received...: 05/08/98
Prep Date.....: 05/12/98 Analysis Date...: 06/02/98
Prep Batch #....: 8132108
Dilution Factor: 20
% Moisture.....: 17 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	790	ug/kg
Aroclor 1221	ND	790	ug/kg
Aroclor 1232	ND	790	ug/kg
Aroclor 1242	ND	790	ug/kg
Aroclor 1248	ND	790	ug/kg
Aroclor 1254	ND	790	ug/kg
Aroclor 1260	ND	790	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	126 DIL	(8.0- 129)
Decachlorobiphenyl	211 DIL, *	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: FIELD BLANK #10

GC Semivolatiles

Lot-Sample #....: A8E080133-012 Work Order #....: CH1V4103 Matrix.....: WATER
 Date Sampled....: 05/07/98 13:20 Date Received...: 05/08/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	70	(10 - 130)
Decachlorobiphenyl	114	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK #10

GC Semivolatiles

Lot-Sample #....: A8E080133-012 Work Order #....: CH1V4102 Matrix.....: WATER
Date Sampled....: 05/07/98 13:20 Date Received...: 05/08/98
Prep Date.....: 05/13/98 Analysis Date...: 05/22/98
Prep Batch #....: 8133104
Dilution Factor: 1 Method.....: SW846 8082

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	86	(10 - 130)
Decachlorobiphenyl	74	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK #10

TOTAL Metals

Lot-Sample #....: A8E080133-012

Matrix.....: WATER

Date Sampled....: 05/07/98 13:20 Date Received...: 05/08/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #....: 8132253						
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH1V4101
Dilution Factor: 1						

3M COMPANY

Client Sample ID: EQUIPMENT BLANK #5

GC Semivolatiles

Lot-Sample #....: A8E080133-013 Work Order #....: CH1V6103 Matrix.....: WATER
Date Sampled....: 05/07/98 13:45 Date Received...: 05/08/98
Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
Prep Batch #....: 8132112
Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
Tetrachloro-m-xylene	84	(10 - 130)
Decachlorobiphenyl	78	(10 - 116)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK #5

GC Semivolatiles

Lot-Sample #....: A8E080133-013 Work Order #....: CH1V6102 Matrix.....: WATER
Date Sampled...: 05/07/98 13:45 Date Received...: 05/08/98
Prep Date.....: 05/13/98 Analysis Date...: 05/22/98
Prep Batch #....: 8133104
Dilution Factor: 1 Method.....: SW846 8082

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	67	(10 - 130)
Decachlorobiphenyl	30	(10 - 116)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK #5

TOTAL Metals

Lot-Sample #...: A8E080133-013

Matrix.....: WATER

Date Sampled...: 05/07/98 13:45 Date Received...: 05/08/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 8132253						
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH1V6101
Dilution Factor: 1						

3M COMPANY

Client Sample ID: RFI-I (RES) SS-11

GC Semivolatiles

Lot-Sample #...: A8E080133-014 Work Order #...: CH1V8103 Matrix.....: SOLID
Date Sampled...: 05/07/98 14:10 Date Received...: 05/08/98
Prep Date.....: 05/14/98 Analysis Date...: 06/02/98
Prep Batch #...: 8134157
Dilution Factor: 20
% Moisture.....: 13 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	760	ug/kg
Aroclor 1221	ND	760	ug/kg
Aroclor 1232	ND	760	ug/kg
Aroclor 1242	ND	760	ug/kg
Aroclor 1248	ND	760	ug/kg
Aroclor 1254	ND	760	ug/kg
Aroclor 1260	ND	760	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	133 DIL, *	(8.0- 129)
Decachlorobiphenyl	228 DIL, *	(0.0- 138)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-11

TOTAL Metals

Lot-Sample #....: A8E080133-014

Matrix.....: SOLID

Date Sampled....: 05/07/98 14:10 Date Received...: 05/08/98

% Moisture.....: 13

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8141113						
Cobalt	120000	5780	ug/kg	SW846 6010A	05/21-05/29/98	CHIV8102
Dilution Factor: 1						

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-10

GC Semivolatiles

Lot-Sample #....: A8E080133-015 Work Order #....: CH1V9103 Matrix.....: SOLID
Date Sampled....: 05/07/98 15:30 Date Received...: 05/08/98
Prep Date.....: 05/14/98 Analysis Date...: 06/02/98
Prep Batch #....: 8134157
Dilution Factor: 20
% Moisture.....: 16 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	780	ug/kg
Aroclor 1221	ND	780	ug/kg
Aroclor 1232	ND	780	ug/kg
Aroclor 1242	ND	780	ug/kg
Aroclor 1248	ND	780	ug/kg
Aroclor 1254	ND	780	ug/kg
Aroclor 1260	ND	780	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	105 DIL	(8.0- 129)
Decachlorobiphenyl	188 DIL, *	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-10

TOTAL Metals

Lot-Sample #...: A8E080133-015

Date Sampled...: 05/07/98 15:30 Date Received...: 05/08/98

% Moisture.....: 16

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 8141113						
Cobalt	109000	5950	ug/kg	SW846 6010A	05/21-05/29/98	CH1V9102
Dilution Factor: 1						

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

QUALITY CONTROL SECTION

QUALITY CONTROL ELEMENTS OF SW-846 METHODS

Quanterra® Incorporated conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

QC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. Quanterra requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. Failure to meet the established recovery guidelines requires the reparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). Failure of the RPDs to fall within the laboratory-generated acceptance windows requires the reparation and reanalysis of all samples in the QC batch. The only exception is that if the MS/MSD RPDs are within acceptance criteria, the batch is acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except for the common laboratory contaminants indicated below.

Volatile (GC or GC/MS)

Methylene chloride
Acetone
2-Butanone

Semivolatile (GC/MS)

Phthalate Esters

Metals

Copper
Iron
Zinc
Lead*

* for analyses run on TJA Trace ICP or GFAA only

QUALITY CONTROL ELEMENTS OF SW-846 METHODS (continued)

METHOD BLANK (continued)

The listed volatile and semivolatile compounds may be present in concentrations up to 5 times the reporting limits. The listed metals may be present in concentrations up to 2 times the reporting limit or must be twenty fold less than the results of the environmental samples. Failure to meet these Method Blank criteria requires the reparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. When these values fail to meet acceptance criteria, the data is reviewed to determine the cause. If, in the analyst's judgment, sample matrix effects are indicated, no corrective action is performed. Otherwise, the MS/MSD and the environmental sample used to prepare them are reprepared and reanalyzed.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample are spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

The acceptance criteria do not apply to samples that are diluted. If the dilution is more than 5X, the recoveries will be reported as diluted out. All other surrogate recoveries will be reported. If the LCS, LCSD, or the Method Blank surrogates fail to meet recovery criteria (exception for dilutions), the entire batch of samples is reprepared and reanalyzed.

If the surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank and the associated sample(s) are ND, the batch is acceptable. If the surrogate recoveries are outside criteria for environmental or MS/MSD samples, the batch may be acceptable based on the analyst's judgment that sample matrix effects are indicated.

For the GC/MS BNA methods, the surrogate criteria is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide/PCB, PAH, TPH, and Herbicide methods, the surrogate criteria is that one of two surrogate compounds meet acceptance criteria.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E080133
 LCS Lot-Sample#: A8E120000-112
 Prep Date.....: 05/12/98
 Prep Batch #....: 8132112
 Dilution Factor: 1

Work Order #....: CH3NN102
 Analysis Date...: 05/29/98

Matrix.....: WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Lindane	76	(63 - 122)	SW846 8081A
Heptachlor	74	(56 - 125)	SW846 8081A
Aldrin	69	(60 - 117)	SW846 8081A
Dieldrin	83	(63 - 122)	SW846 8081A
Endrin	79	(48 - 129)	SW846 8081A
4,4'-DDT	87	(55 - 128)	SW846 8081A

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	56	(10 - 130)
Decachlorobiphenyl	20	(10 - 116)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E080133 Work Order #....: CH3NF102 Matrix.....: SOLID
 LCS Lot-Sample#: A8E120000-107
 Prep Date.....: 05/12/98 Analysis Date...: 05/30/98
 Prep Batch #....: 8132107
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Lindane	59	(52 - 108)	SW846 8081A
Heptachlor	58	(53 - 130)	SW846 8081A
Aldrin	49	(43 - 116)	SW846 8081A
Dieldrin	62	(62 - 107)	SW846 8081A
Endrin	66	(64 - 127)	SW846 8081A
4,4'-DDT	74	(52 - 128)	SW846 8081A

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	68	(8.0- 129)
Decachlorobiphenyl	64	(0.0- 138)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E080133 Work Order #....: CH5JF102 Matrix.....: SOLID
 LCS Lot-Sample#: A8E140000-157
 Prep Date.....: 05/14/98 Analysis Date...: 05/29/98
 Prep Batch #....: 8134157
 Dilution Factor: 2

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Aroclor 1016	95	(60 - 133)	SW846 8082
Aroclor 1260	100	(59 - 129)	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	98	(8.0- 129)
Decachlorobiphenyl	106	(0.0- 138)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E080133 Work Order #....: CH3NG102 Matrix.....: SOLID
 LCS Lot-Sample#: A8E120000-108
 Prep Date.....: 05/12/98 Analysis Date...: 05/27/98
 Prep Batch #....: 8132108
 Dilution Factor: 2

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Aroclor 1016	93	(60 - 133)	SW846 8082
Aroclor 1260	100	(59 - 129)	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	98	(8.0- 129)
Decachlorobiphenyl	115	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E080133 Work Order #....: CH4JG102-LCS Matrix.....: WATER
 LCS Lot-Sample#: A8E130000-104 CH4JG103-LCSD
 Prep Date.....: 05/13/98 Analysis Date...: 05/22/98
 Prep Batch #....: 8133104
 Dilution Factor: 2

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Aroclor 1016	91	(66 - 111)			SW846 8082
	88	(66 - 111)	2.4	(0-23)	SW846 8082
Aroclor 1260	93	(65 - 111)			SW846 8082
	92	(65 - 111)	1.1	(0-23)	SW846 8082

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	96	(10 - 130)
	93	(10 - 130)
Decachlorobiphenyl	92	(10 - 116)
	90	(10 - 116)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E080133

Matrix.....: WATER

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
LCS Lot-Sample#:	A8E120000-253	Prep Batch #....: 8132253			
Cobalt	96	(83 - 107)	SW846 6010A	05/13-05/18/98	CH4EA103
		Dilution Factor: 1			

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E080133

Matrix.....: SOLID

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
LCS Lot-Sample#:	A8E210000-113	Prep Batch #....: 8141113			
Cobalt	90	(80 - 104)	SW846 6010A	05/21-05/29/98	CHC3F11H
Dilution Factor: 1					

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #....: A8E080133
 MB Lot-Sample #: A8E120000-112
 Analysis Date...: 05/29/98
 Dilution Factor: 1

Work Order #....: CH3NN101
 Prep Date.....: 05/12/98
 Prep Batch #....: 8132112

Matrix.....: WATER

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Hexachlorobenzene	ND	0.050	ug/L	SW846 8081A

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	52	(10 - 130)
Decachlorobiphenyl	58	(10 - 116)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E080133
 MB Lot-Sample #: A8E120000-107
 Analysis Date...: 06/03/98
 Dilution Factor: 1

Work Order #...: CH3NF101
 Prep Date.....: 05/12/98
 Prep Batch #...: 8132107

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Hexachlorobenzene	ND	3.3	ug/kg	SW846 8081A
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>		
Tetrachloro-m-xylene	98	(8.0- 129)		
Decachlorobiphenyl	188 *	(0.0- 138)		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

* Surrogate recovery is outside stated control limits.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #....: A8E080133
MB Lot-Sample #: A8E140000-157

Work Order #....: CH5JF101

Matrix.....: SOLID

Analysis Date...: 05/28/98
Dilution Factor: 1

Prep Date.....: 05/14/98
Prep Batch #....: 8134157

<u>PARAMETER</u>	<u>RESULT</u>	<u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	33	ug/kg	SW846 8082
Aroclor 1232	ND	33	ug/kg	SW846 8082
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>		
Tetrachloro-m-xylene	90	(8.0- 129)		
Decachlorobiphenyl	100	(0.0- 138)		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.
Results and reporting limits have been adjusted for dry weight.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E080133
 MB Lot-Sample #: A8E120000-108
 Analysis Date...: 05/27/98
 Dilution Factor: 1

Work Order #...: CH3NG101
 Prep Date.....: 05/12/98
 Prep Batch #...: 8132108

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	33	ug/kg	SW846 8082
Aroclor 1232	ND	33	ug/kg	SW846 8082
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>		
Tetrachloro-m-xylene	82	(8.0- 129)		
Decachlorobiphenyl	93	(0.0- 138)		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #....: A8E080133
 MB Lot-Sample #: A8E130000-104

Work Order #....: CH4JG101

Matrix.....: WATER

Analysis Date...: 05/22/98
 Dilution Factor: 1

Prep Date.....: 05/13/98

Prep Batch #....: 8133104

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Aroclor 1016	ND	1.0	ug/L	SW846 8082
Aroclor 1221	ND	1.0	ug/L	SW846 8082
Aroclor 1232	ND	1.0	ug/L	SW846 8082
Aroclor 1242	ND	1.0	ug/L	SW846 8082
Aroclor 1248	ND	1.0	ug/L	SW846 8082
Aroclor 1254	ND	1.0	ug/L	SW846 8082
Aroclor 1260	ND	1.0	ug/L	SW846 8082
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS		
Tetrachloro-m-xylene	82	(10 - 130)		
Decachlorobiphenyl	79	(10 - 116)		

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #....: A8E080133

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: A8E120000-253				Prep Batch #....: 8132253		
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH4EA101
Dilution Factor: 1						

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: A8E080133

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #:	A8E210000-113	Prep Batch #...	8141113			
Cobalt	ND	5000	ug/kg	SW846 6010A	05/21-05/29/98	CHC3F10Q
Dilution Factor: 1						

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: A8E080133

Matrix.....: WATER

Date Sampled...: 05/05/98 08:45 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8E060157-012 Prep Batch #...: 8132253						
Cobalt	97	(80 - 120)		SW846 6010A	05/13-05/18/98	CGXXT106
	96	(80 - 120)	0.96 (0-20)	SW846 6010A	05/13-05/18/98	CGXXT107
Dilution Factor: 1						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E080133

Matrix.....: SOLID

Date Sampled....: 05/14/98 11:10 Date Received...: 05/16/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8E160133-013				Prep Batch #....: 8141113		
Cobalt	89	(80 - 120)		SW846 6010A	05/21-05/29/98	CH84E12D
	87	(80 - 120)	1.9 (0-20)	SW846 6010A	05/21-05/29/98	CH84E12E
		Dilution Factor: 1				

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

Chain of Custody Record

Custody

Seals: 042706 + 042761

Qualifica

QUA-4149-1

Client 3M - Cordova, ILL		Project Manager John Hunter		Date May 7, 1998	Page 1 of 1
Address 935 Bush Avenue		Telephone Number (Area Code)/Fax Number 612-778-5388		Lab Location North Canton, Minn.	Analysis As 6010A trace CC 6010A trace HCR 8080A PCR 8080A To Temp measure
City St. Paul	State MN	Zip Code 55144-1000	Site Contact Carol Snyder, 5		
Project Number/Name Cordova RFI - May 1998		Carrier/Waybill Number FED EX: 8005-4025-1793			
Contract/Purchase Order/Quote Number 102801 / 10100					

Sample I.D. Number and Description	Date	Time	Sample Type	Containers			Preservative	Condition on Receipt/Comments	As	CC	HCR	PCR	To Temp measure
				Volume	Type	No.							
✓ Temperature Blank SS-5/2	5-7-98	—	Water	40 ml	Plastic	1	None						
✓ RFI-1 (RES) SS-15		0845	Soil	120 ml	Glass	3	None		X	X	X	X	
✓ RFI-1 (RES) SS-4		0915	↓	↓	↓	↓	↓		X	X	X	X	
✓ Field Duplicate 7		0915	↓	↓	↓	↓	↓		X	X	X	X	
✓ RFI-1 (RES) SS-19		1100	↓	↓	↓	↓	↓		X	X	X	X	
✓ RFI-1 (RES) SS-2		1130	↓	↓	↓	↓	↓		X	X	X	X	
✓ Field Blank 5/2010	1320	1320	Water	1 liter	Glass	2	None		X	X	X	X	
→ Equipment Blank 5/7-8	1345	1345	↓	↓	Plastic	1	HNO ₃		X	X	X	X	
✓ Equipment Blank 5	1345	1345	↓	↓	Glass	2	None		X	X	X	X	
✓ " "	↓	↓	↓	↓	Plastic	1	HNO ₃		X	X	X	X	
✓ RFI-1 (RES) SS-11	1410	1410	Soil	120 ml	Glass	3	None		X	X	X	X	
✓ RFI-1 (RES) SS-10	1530	1530	↓	↓	↓	↓	↓		X	X	X	X	

Special Instructions

Call Cathy Larson at (612) 551-2474 OR Carol Snyder at (612) 778-5388 / Questions

Possible Hazard Identification

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal

☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required

☒ Normal ☐ Rush ☐ Other _____

QC Level

☐ I. ☐ II. ☐ III.

Project Specific Requirements (Specify)

See 3M Cordova - RFI Work Plan

1. Relinquished By

[Signature]

Date: 5-7-98 Time: 1630

2. Relinquished By

[Signature]

Date: 5/7/98 Time: 1715

3. Relinquished By

[Signature]

1. Received By

Date: _____ Time: _____

2. Received By

Date: _____ Time: _____

3. Received By

Date: 5-8-98 Time: 1000

Comments

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

② Temp. Blank at 2.7 °C prior to ship 5/7/98

CORDOVA RFI

**MAY 1998
ANALYTICAL REPORT**

LOT #: A8E110118

Quanterra Incorporated
4101 Shuffel Drive, NW
North Canton, Ohio 44720

330 497-9396 Telephone
330 497-0772 Fax

ANALYTICAL REPORT


CORDOVA RFI MAY 1998

Lot #: A8E110118

Carol Snyder

3M Company

QUANTERRA INCORPORATED


Jeffrey C. Smith
Project Manager

June 15, 1998

CASE NARRATIVE

The following report contains the analytical results for eight water samples and four solid samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were received May 9, 1998 according to documented sample acceptance procedures.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder on June 5, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

The coolers were received at the laboratory at temperatures of 1.1, 2.3, 0.6 and 1.3° C.

SUPPLEMENTAL QC INFORMATION

SAMPLE RECEIVING

Three 40ml volatile vials for sample Trip blank were received with headspace.

One liter amber glass for sample RFI-I (RES)-MW 8-90(s) was received broken. One liter amber glass for sample RFI-I (RES) MW3-94 was received with a cracked lid, which was replaced upon receipt.

GC/MS VOLATILES

The matrix spike/matrix spike duplicate associated with batch 8134287 failed surrogate recovery criteria. The laboratory control sample associated with this batch was in control. This is believed to be a matrix effect; therefore, no further corrective action was taken.

Surrogate recovery is outside acceptance limits in sample RFI-I (RES) MW8-90 (MS/MSD). Reextraction and/or reanalysis achieved similar results; therefore, the original data has been reported.

GC SEMIVOLATILES – Organochlorine Pesticides

Sample RFI-I (RES) SS-6 was diluted due to matrix effects and was ND; therefore, the detection limites were elevated.

CASE NARRATIVE (continued)

GC SEMIVOLATILES – Polychlorinated Biphenyls

Sample RFI-I (RES) SS-6 was diluted due to matrix effects and was ND; therefore, the detection limites were elevated.

METALS

Matrix spike/spike duplicate spike recoveries were outside the acceptance limits for some analytes. The acceptable laboratory control sample analysis data indicated that the analytical system was operating within control and this condition is most likely due to matrix interference. See the Matrix Spike Report for the affected analytes which will be flagged with "N".

Matrix spike/spike duplicate relative percent difference (RPD) exceeded the acceptance limits for some analytes. The imprecision may be attributed to sample heterogeneity. See the Matrix Spike Report for the affected analytes which will be flagged with "*".

ANALYTICAL METHODS SUMMARY

A8E110118

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>
Amenable Cyanide	SW846 9012
Inductively Coupled Plasma (ICP) Metals	SW846 6010A
Organochlorine Pesticides	SW846 8081A
PCBs	SW846 8082
Total Cyanide	SW846 9012
Total Residue as Percent Solids	MCAWW 160.3 MOD
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010A
Volatile Organics by GC/MS	SW846 8260A

References:

- MCAWW "Methods for Chemical Analysis of Water and Wastes",
EPA-600/4-79-020, March 1983 and subsequent revisions.
- SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical
Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

A8E110118

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CH39V	001	RFI-I (RES) MW3-94	05/07/98	17:53
CH3A1	002	RFI-I (RES) MW1-88	05/08/98	08:44
CH3A2	003	RFI-I (RES) MW8-90 (MS/MSD)	05/08/98	10:26
CH3A3	004	FIELD DUPLICATE #4	05/08/98	10:28
CH3A7	005	EQUIPMENT BLANK #3	05/08/98	11:19
CH3AA	006	FIELD BLANK #5	05/08/98	11:42
CH3AD	007	TRIP BLANK	05/08/98	
CH3AF	008	RFI-1 (RES) SS-8	05/08/98	08:00
CH3AG	009	FIELD BLANK 11	05/08/98	08:15
CH3AH	010	RFI-1 (RES) SS-9	05/08/98	09:00
CH3AK	011	FIELD DUPLICATE 8	05/08/98	09:00
CH3AL	012	RFI-1 (RES) SS-6	05/08/98	09:40

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.

Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

3M COMPANY

Client Sample ID: RFI-I (RES) MW3-94

GC Semivolatiles

Lot-Sample #....: A8E110118-001 Work Order #....: CH39V101 Matrix.....: WATER
Date Sampled....: 05/07/98 17:53 Date Received...: 05/09/98
Prep Date.....: 05/13/98 Analysis Date...: 05/30/98
Prep Batch #....: 8133254
Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	66	(10 - 130)
Decachlorobiphenyl	56	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW1-88

GC Semivolatiles

Lot-Sample #....: A8E110118-002 Work Order #....: CH3A1101 Matrix.....: WATER
 Date Sampled....: 05/08/98 08:44 Date Received...: 05/09/98
 Prep Date.....: 05/13/98 Analysis Date...: 06/03/98
 Prep Batch #....: 8133254
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	82	(10 - 130)
Decachlorobiphenyl	129 *	(10 - 116)

NOTE(S) :

* Surrogate recovery is outside stated control limits.

3M COMPANY

Client Sample ID: RFI-I (RES) MW8-90 (MS/MSD)

GC Semivolatiles

Lot-Sample #....: A8E110118-003 Work Order #....: CH3A2101 Matrix.....: WATER
 Date Sampled....: 05/08/98 10:26 Date Received...: 05/09/98
 Prep Date.....: 05/13/98 Analysis Date...: 06/03/98
 Prep Batch #....: 8133254
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	68	(10 - 130)
Decachlorobiphenyl	104	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RBS) MW8-90 (MS/MSD)

GC/MS Volatiles

Lot-Sample #....: A8E110118-003 Work Order #....: CH3A2103 Matrix.....: WATER
 Date Sampled....: 05/08/98 10:26 Date Received...: 05/09/98
 Prep Date.....: 05/14/98 Analysis Date...: 05/14/98
 Prep Batch #....: 8134287
 Dilution Factor: 1 Method.....: SW846 8260A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	ND	0.25	ug/L
Chloromethane	ND	2.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Ethyl methacrylate	ND	1.0	ug/L
2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	40	ug/L
Methacrylonitrile	ND	10	ug/L
Ethylene chloride	ND	1.0	ug/L

(Continued on next page)

3M COMPANY

Client Sample ID: RFI-I (RES) MW8-90 (MS/MSD)

GC/MS Volatiles

Lot-Sample #....: A8E110118-003 Work Order #....: CH3A2103 Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
m-Dichlorobenzene	ND	1.0	ug/L
p-Dichlorobenzene	ND	1.0	ug/L
o-Dichlorobenzene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	90	(69 - 127)
Toluene-d8	93	(90 - 112)
Bromofluorobenzene	85 *	(87 - 114)

NOTE(S):

* Surrogate recovery is outside stated control limits.

Surrogates outside acceptance criteria due to demonstrated matrix effect. *

3M COMPANY

Client Sample ID: FIELD DUPLICATE #4

GC/MS Volatiles

Lot-Sample #....: A8E110118-004 Work Order #....: CH3A3101 Matrix.....: WATER
 Date Sampled....: 05/08/98 10:28 Date Received...: 05/09/98
 Prep Date.....: 05/14/98 Analysis Date...: 05/14/98
 Prep Batch #....: 8134287
 Dilution Factor: 1 Method.....: SW846 8260A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	ND	0.25	ug/L
Chloromethane	ND	2.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Ethyl methacrylate	ND	1.0	ug/L
2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	40	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	ND	1.0	ug/L

(Continued on next page)

3M COMPANY

Client Sample ID: FIELD DUPLICATE #4

GC/MS Volatiles

Lot-Sample #....: A8E110118-004 Work Order #....: CH3A3101 Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
p-Dichlorobenzene	ND	1.0	ug/L
m-Dichlorobenzene	ND	1.0	ug/L
o-Dichlorobenzene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	92	(69 - 127)
Toluene-d8	97	(90 - 112)
Bromofluorobenzene	95	(87 - 114)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK #3

GC Semivolatiles

Lot-Sample #....: A8E110118-005 Work Order #....: CH3A7104 Matrix.....: WATER
 Date Sampled....: 05/08/98 11:19 Date Received...: 05/09/98
 Prep Date.....: 05/13/98 Analysis Date...: 05/30/98
 Prep Batch #....: 8133254
 Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	45	(10 - 130)
Decachlorobiphenyl	42	(10 - 116)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK #3

GC/MS Volatiles

Lot-Sample #....: A8E110118-005 Work Order #....: CH3A7103
 Date Sampled....: 05/08/98 11:19 Date Received...: 05/09/98
 Prep Date.....: 05/14/98 Analysis Date...: 05/14/98
 Prep Batch #....: 8134287
 Dilution Factor: 1 Method.....: SW846 8260A

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	0.46	0.25	ug/L
Chloromethane	ND	2.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Ethyl methacrylate	ND	1.0	ug/L
2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	40	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	2.2	1.0	ug/L

(Continued on next page)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK #3

GC/MS Volatiles

Lot-Sample #....: A8E110118-005 Work Order #....: CH3A7103 Matrix.....: WATER

PARAMETER	RESULT	REPORTING	
		LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
m-Dichlorobenzene	ND	1.0	ug/L
p-Dichlorobenzene	ND	1.0	ug/L
o-Dichlorobenzene	ND	1.0	ug/L

SURROGATE	PERCENT	RECOVERY
	RECOVERY	LIMITS
1,2-Dichloroethane-d4	91	(69 - 127)
Toluene-d8	100	(90 - 112)
Bromofluorobenzene	94	(87 - 114)

3M COMPANY

Client Sample ID: EQUIPMENT BLANK #3

General Chemistry

Lot-Sample #....: A8E110118-005
Date Sampled....: 05/08/98 11:19

Work Order #....: CH3A7
Date Received...: 05/09/98

Matrix.....: WATER

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	0.010	mg/L	SW846 9012	05/21/98	8141163
		Dilution Factor: 1				
Total Cyanide	ND	0.010	mg/L	SW846 9012	05/21/98	8141163
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: FIELD BLANK #5

GC/MS Volatiles

Lot-Sample #....: A8E110118-006 Work Order #....: CH3AA101 Matrix.....: WATER
 Date Sampled....: 05/08/98 11:42 Date Received...: 05/09/98
 Prep Date.....: 05/21/98 Analysis Date...: 05/21/98
 Prep Batch #....: 8141315
 Dilution Factor: 1 Method.....: SW846 8260A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	ND	0.25	ug/L
Chloromethane	ND	2.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Ethyl methacrylate	ND	1.0	ug/L
2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	40	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	1.1	1.0	ug/L

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3M COMPANY

Client Sample ID: FIELD BLANK #5

GC/MS Volatiles

Lot-Sample #....: A8E110118-006 Work Order #....: CH3AA101 Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
m-Dichlorobenzene	ND	1.0	ug/L
p-Dichlorobenzene	ND	1.0	ug/L
o-Dichlorobenzene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	96	(69 - 127)
Toluene-d8	106	(90 - 112)
Bromofluorobenzene	110	(87 - 114)

3M COMPANY

Client Sample ID: FIELD BLANK #5

GC Semivolatiles

Lot-Sample #....: A8E110118-006 Work Order #....: CH3AA102 Matrix.....: WATER
 Date Sampled...: 05/08/98 11:42 Date Received...: 05/09/98
 Prep Date.....: 05/13/98 Analysis Date...: 06/03/98
 Prep Batch #....: 8133254
 Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	101	(10 - 130)
Decachlorobiphenyl	123 *	(10 - 116)

NOTE(S) :

* Surrogate recovery is outside stated control limits.

3M COMPANY

Client Sample ID: TRIP BLANK

GC/MS Volatiles

Lot-Sample #....: A8E110118-007 Work Order #....: CH3AD101
 Date Sampled....: 05/08/98 Date Received...: 05/09/98
 Prep Date.....: 05/14/98 Analysis Date...: 05/14/98
 Prep Batch #....: 8134287
 Dilution Factor: 1 Method.....: SW846 8260A

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acetone	ND	10	ug/L
Acetonitrile	ND	20	ug/L
Acrolein	ND	20	ug/L
Acrylonitrile	ND	20	ug/L
Allyl chloride	ND	2.0	ug/L
Benzene	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Bromomethane	ND	2.0	ug/L
2-Butanone (MEK)	ND	10	ug/L
Carbon disulfide	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
Chlorobenzene	ND	1.0	ug/L
Chloroethane	ND	2.0	ug/L
Chloroform	ND	0.25	ug/L
Chloromethane	ND	2.0	ug/L
Chloroprene	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L
1,2-Dibromoethane (EDB)	ND	1.0	ug/L
Dibromomethane	ND	1.0	ug/L
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L
Dichlorodifluoromethane	ND	2.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	0.50	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
cis-1,3-Dichloropropene	ND	1.0	ug/L
trans-1,3-Dichloropropene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Ethyl methacrylate	ND	1.0	ug/L
2-Hexanone	ND	10	ug/L
Iodomethane	ND	1.0	ug/L
Isobutyl alcohol	ND	40	ug/L
Methacrylonitrile	ND	10	ug/L
Methylene chloride	1.2	1.0	ug/L

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3M COMPANY

Client Sample ID: TRIP BLANK

GC/MS Volatiles

Lot-Sample #....: A8E110118-007 Work Order #....: CH3AD101

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Methyl methacrylate	ND	1.0	ug/L
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L
Propionitrile	ND	4.0	ug/L
Styrene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
Trichlorofluoromethane	ND	2.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
Vinyl acetate	ND	2.0	ug/L
Vinyl chloride	ND	2.0	ug/L
Xylenes (total)	ND	1.0	ug/L
Dichlorobenzene	ND	1.0	ug/L
p-Dichlorobenzene	ND	1.0	ug/L
o-Dichlorobenzene	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	92	(69 - 127)
Toluene-d8	98	(90 - 112)
Bromofluorobenzene	91	(87 - 114)

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-8

GC Semivolatiles

Lot-Sample #....: A8E110118-008 Work Order #....: CH3AF103 Matrix.....: SOLID
Date Sampled....: 05/08/98 08:00 Date Received...: 05/09/98
Prep Date.....: 05/27/98 Analysis Date...: 05/28/98
Prep Batch #....: 8147142
Dilution Factor: 1
% Moisture.....: 17 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	1.2	mg/kg
Aroclor 1221	ND	1.2	mg/kg
Aroclor 1232	ND	1.2	mg/kg
Aroclor 1242	ND	1.2	mg/kg
Aroclor 1248	ND	1.2	mg/kg
Aroclor 1254	ND	1.2	mg/kg
Aroclor 1260	ND	1.2	mg/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	130 *	(8.0- 129)
Decachlorobiphenyl	124	(0.0- 138)

NOTE(S):

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-8

TOTAL Metals

Lot-Sample #....: A8E110118-008

Matrix.....: SOLID

Date Sampled...: 05/08/98 08:00 Date Received...: 05/09/98

% Moisture.....: 17

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8135119						
Cobalt	143000	5990	ug/kg	SW846 6010A	05/15-05/18/98	CH3AF102
Dilution Factor: 1						

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RKS) SS-8

General Chemistry

Lot-Sample #....: A8E110118-008 Work Order #....: CH3AF Matrix.....: SOLID
 Date Sampled....: 05/08/98 08:00 Date Received...: 05/09/98
 % Moisture.....: 17

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	83.4	0.10	%	MCAWW 160.3 MOD	05/12-05/13/98	8132118
Dilution Factor: 1						

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD BLANK 11

GC Semivolatiles

Lot-Sample #....: A8E110118-009 Work Order #....: CH3AG103 Matrix.....: WATER
Date Sampled....: 05/08/98 08:15 Date Received...: 05/09/98
Prep Date.....: 05/13/98 Analysis Date...: 06/03/98
Prep Batch #....: 8133254
Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	80	(10 - 130)
Decachlorobiphenyl	114	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK 11

GC Semivolatiles

Lot-Sample #....: A8E110118-009 Work Order #....: CH3AG102 Matrix.....: WATER
 Date Sampled....: 05/08/98 08:15 Date Received...: 05/09/98
 Prep Date.....: 05/13/98 Analysis Date...: 05/22/98
 Prep Batch #....: 8133104
 Dilution Factor: 1 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	80	(10 - 130)
Decachlorobiphenyl	71	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK 11

TOTAL Metals

Lot-Sample #...: A8E110118-009

Matrix.....: WATER

Date Sampled...: 05/08/98 08:15 Date Received...: 05/09/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 8132253						
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH3AG101
Dilution Factor: 1						

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-9

GC Semivolatiles

Lot-Sample #...: A8E110118-010 Work Order #...: CH3AH103 Matrix.....: SOLID
Date Sampled...: 05/08/98 09:00 Date Received...: 05/09/98
Prep Date.....: 05/14/98 Analysis Date...: 05/29/98
Prep Batch #...: 8134157
Dilution Factor: 1
% Moisture.....: 11 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING	
		LIMIT	UNITS
Aroclor 1016	ND	37	ug/kg
Aroclor 1221	ND	37	ug/kg
Aroclor 1232	ND	37	ug/kg
Aroclor 1242	ND	37	ug/kg
Aroclor 1248	ND	37	ug/kg
Aroclor 1254	ND	37	ug/kg
Aroclor 1260	ND	37	ug/kg

SURROGATE	PERCENT	
	RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	103	(8.0- 129)
Decachlorobiphenyl	107	(0.0- 138)

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-9

TOTAL Metals

Lot-Sample #....: A8E110118-010

Matrix.....: SOLID

Date Sampled....: 05/08/98 09:00 Date Received...: 05/09/98

% Moisture.....: 11

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8135119						
Cobalt	38800	5620	ug/kg	SW846 6010A	05/15-05/18/98	CH3AH102
Dilution Factor: 1						

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-9

General Chemistry

Lot-Sample #....: A8E110118-010
Date Sampled....: 05/08/98 09:00
% Moisture.....: 11

Work Order #....: CH3AH
Date Received...: 05/09/98

Matrix.....: SOLID

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	89.0	0.10	%	MCAWW 160.3 MOD	05/12-05/13/98	8132118

Dilution Factor: 1

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD DUPLICATE 8

GC Semivolatiles

Lot-Sample #....: A8E110118-011 Work Order #....: CH3AK103 Matrix.....: SOLID
Date Sampled....: 05/08/98 09:00 Date Received...: 05/09/98
Prep Date.....: 05/14/98 Analysis Date...: 05/29/98
Prep Batch #....: 8134157
Dilution Factor: 1
% Moisture.....: 11 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	37	ug/kg
Aroclor 1221	ND	37	ug/kg
Aroclor 1232	ND	37	ug/kg
Aroclor 1242	ND	37	ug/kg
Aroclor 1248	ND	37	ug/kg
Aroclor 1254	ND	37	ug/kg
Aroclor 1260	ND	37	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	112	(8.0- 129)
Decachlorobiphenyl	131	(0.0- 138)

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD DUPLICATE 8

TOTAL Metals

Lot-Sample #....: A8E110118-011

Matrix.....: SOLID

Date Sampled...: 05/08/98 09:00 Date Received...: 05/09/98

% Moisture.....: 11

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8135119						
Cobalt	58300	5650	ug/kg	SW846 6010A	05/15-05/18/98	CH3AK102

Dilution Factor: 1

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD DUPLICATE 8

General Chemistry

Lot-Sample #....: A8E110118-011 Work Order #....: CH3AK Matrix.....: SOLID
 Date Sampled....: 05/08/98 09:00 Date Received...: 05/09/98
 % Moisture.....: 11

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	88.5	0.10	%	MCAWW 160.3 MOD	05/12-05/13/98	8132118

Dilution Factor: 1

NOTE(S) :

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-6

GC Semivolatiles

Lot-Sample #....: A8E110118-012 Work Order #....: CH3AL103 Matrix.....: SOLID
Date Sampled....: 05/08/98 09:40 Date Received...: 05/09/98
Prep Date.....: 05/12/98 Analysis Date...: 06/03/98
Prep Batch #....: 8132107
Dilution Factor: 10
% Moisture.....: 12 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	38	ug/kg

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
Tetrachloro-m-xylene	0.0 DIL, *	(8.0- 129)
Decachlorobiphenyl	0.0 DIL	(0.0- 138)

NOTE (S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-6

GC Semivolatiles

Lot-Sample #....: A8E110118-012 Work Order #....: CH3AL102 Matrix.....: SOLID
Date Sampled....: 05/08/98 09:40 Date Received...: 05/09/98
Prep Date.....: 05/12/98 Analysis Date...: 06/02/98
Prep Batch #....: 8132108
Dilution Factor: 20
% Moisture.....: 12 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	750	ug/kg
Aroclor 1221	ND	750	ug/kg
Aroclor 1232	ND	750	ug/kg
Aroclor 1242	ND	750	ug/kg
Aroclor 1248	ND	750	ug/kg
Aroclor 1254	ND	750	ug/kg
Aroclor 1260	ND	750	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	86 DIL	(8.0- 129)
Decachlorobiphenyl	202 DIL,*	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-1 (RES) SS-6

General Chemistry

Lot-Sample #....: A8E110118-012 Work Order #....: CH3AL Matrix.....: SOLID
 Date Sampled....: 05/08/98 09:40 Date Received...: 05/09/98
 % Moisture.....: 12

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	87.5	0.10	%	MCAWW 160.3 MOD	05/12-05/13/98	8132118

Dilution Factor: 1

NOTE(S):

RL Reporting Limit

Results and reporting limits have been adjusted for dry weight.

QUALITY CONTROL SECTION

QUALITY CONTROL ELEMENTS OF SW-846 METHODS

Quanterra® Incorporated conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

QC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. Quanterra requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. Failure to meet the established recovery guidelines requires the reparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). Failure of the RPDs to fall within the laboratory-generated acceptance windows requires the reparation and reanalysis of all samples in the QC batch. The only exception is that if the MS/MSD RPDs are within acceptance criteria, the batch is acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except for the common laboratory contaminants indicated below.

Volatile (GC or GC/MS)

Methylene chloride
Acetone
2-Butanone

Semivolatile (GC/MS)

Phthalate Esters

Metals

Copper
Iron
Zinc
Lead*

** for analyses run on TJA Trace ICP or GFAA only*

QUALITY CONTROL ELEMENTS OF SW-846 METHODS (continued)

METHOD BLANK (continued)

The listed volatile and semivolatile compounds may be present in concentrations up to 5 times the reporting limits. The listed metals may be present in concentrations up to 2 times the reporting limit or must be twenty fold less than the results of the environmental samples. Failure to meet these Method Blank criteria requires the reparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. When these values fail to meet acceptance criteria, the data is reviewed to determine the cause. If, in the analyst's judgment, sample matrix effects are indicated, no corrective action is performed. Otherwise, the MS/MSD and the environmental sample used to prepare them are reprepared and reanalyzed.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample are spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

The acceptance criteria do not apply to samples that are diluted. If the dilution is more than 5X, the recoveries will be reported as diluted out. All other surrogate recoveries will be reported. If the LCS, LCSD, or the Method Blank surrogates fail to meet recovery criteria (exception for dilutions), the entire batch of samples is reprepared and reanalyzed.

If the surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank and the associated sample(s) are ND, the batch is acceptable. If the surrogate recoveries are outside criteria for environmental or MS/MSD samples, the batch may be acceptable based on the analyst's judgment that sample matrix effects are indicated.

For the GC/MS BNA methods, the surrogate criteria is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide/PCB, PAH, TPH, and Herbicide methods, the surrogate criteria is that one of two surrogate compounds meet acceptance criteria.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: A8E110118 Work Order #...: CHD4R102 Matrix.....: WATER
 LCS Lot-Sample#: A8E210000-315
 Prep Date.....: 05/21/98 Analysis Date...: 05/21/98
 Prep Batch #...: 8141315
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
1,1-Dichloroethene	104	(87 - 113)	SW846 8260A
Trichloroethene	97	(89 - 115)	SW846 8260A
Chlorobenzene	103	(89 - 119)	SW846 8260A
Toluene	107	(81 - 117)	SW846 8260A
Benzene	103	(77 - 126)	SW846 8260A

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
1,2-Dichloroethane-d4	91	(69 - 127)
Toluene-d8	106	(90 - 112)
Bromofluorobenzene	109	(87 - 114)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 d print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: A8E110118 Work Order #...: CH6CN102 Matrix.....: WATER
 LCS Lot-Sample#: A8E140000-287
 Prep Date.....: 05/14/98 Analysis Date...: 05/14/98
 Prep Batch #...: 8134287
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
1,1-Dichloroethene	95	(87 - 113)	SW846 8260A
Trichloroethene	91	(89 - 115)	SW846 8260A
Chlorobenzene	100	(89 - 119)	SW846 8260A
Toluene	97	(81 - 117)	SW846 8260A
Benzene	95	(77 - 126)	SW846 8260A

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
1,2-Dichloroethane-d4	88	(69 - 127)
Toluene-d8	98	(90 - 112)
Bromofluorobenzene	92	(87 - 114)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E110118 Work Order #....: CH3NF102 Matrix.....: SOLID
 LCS Lot-Sample#: A8E120000-107
 Prep Date.....: 05/12/98 Analysis Date...: 05/30/98
 Prep Batch #....: 8132107
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Lindane	59	(52 - 108)	SW846 8081A
Heptachlor	58	(53 - 130)	SW846 8081A
Aldrin	49	(43 - 116)	SW846 8081A
Dieldrin	62	(62 - 107)	SW846 8081A
Endrin	66	(64 - 127)	SW846 8081A
4,4'-DDT	74	(52 - 128)	SW846 8081A

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	68	(8.0- 129)
Decachlorobiphenyl	64	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E110118 Work Order #....: CH58X102 Matrix.....: WATER
 LCS Lot-Sample#: A8E130000-254
 Prep Date.....: 05/13/98 Analysis Date...: 05/30/98
 Prep Batch #....: 8133254
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Lindane	84	(63 - 122)	SW846 8081A
Heptachlor	80	(56 - 125)	SW846 8081A
Aldrin	75	(60 - 117)	SW846 8081A
Dieldrin	95	(63 - 122)	SW846 8081A
Endrin	71	(48 - 129)	SW846 8081A
4,4'-DDT	93	(55 - 128)	SW846 8081A

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	66	(10 - 130)
Decachlorobiphenyl	70	(10 - 116)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E110118 Work Order #....: CHFPP102-LCS Matrix.....: SOLID
 LCS Lot-Sample#: A8E270000-142 CHFPP103-LCSD
 Prep Date.....: 05/27/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8147142
 Dilution Factor: 20

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Aroclor 1016	121	(60 - 133)			SW846 8082
	124	(60 - 133)	2.3	(0-37)	SW846 8082
Aroclor 1260	124	(59 - 129)			SW846 8082
	126	(59 - 129)	2.0	(0-35)	SW846 8082

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	193 DIL, *	(8.0- 129)
	198 DIL, *	(8.0- 129)
Decachlorobiphenyl	168 DIL, *	(0.0- 138)
	175 DIL, *	(0.0- 138)

NOTE (S) :

- Calculations are performed before rounding to avoid round-off errors in calculated results.
- The concentration is estimated or not reported due to dilution or the presence of interfering analytes.
- * Surrogate recovery is outside stated control limits.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...: A8E110118 Work Order #...: CH4JG102-LCS Matrix.....: WATER
 LCS Lot-Sample#: A8E130000-104 CH4JG103-LCSD
 Prep Date.....: 05/13/98 Analysis Date...: 05/22/98
 Prep Batch #...: 8133104
 Dilution Factor: 2

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Aroclor 1016	91	(66 - 111)			SW846 8082
	88	(66 - 111)	2.4	(0-23)	SW846 8082
Aroclor 1260	93	(65 - 111)			SW846 8082
	92	(65 - 111)	1.1	(0-23)	SW846 8082

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	96	(10 - 130)
	93	(10 - 130)
Decachlorobiphenyl	92	(10 - 116)
	90	(10 - 116)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E110118 Work Order #....: CH5JF102 Matrix.....: SOLID
 LCS Lot-Sample#: A8E140000-157
 Prep Date.....: 05/14/98 Analysis Date...: 05/29/98
 Prep Batch #....: 8134157
 Dilution Factor: 2

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Aroclor 1016	95	(60 - 133)	SW846 8082
Aroclor 1260	100	(59 - 129)	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	98	(8.0- 129)
Decachlorobiphenyl	106	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E110118 Work Order #....: CH3NG102 Matrix.....: SOLID
 LCS Lot-Sample#: A8E120000-108
 Prep Date.....: 05/12/98 Analysis Date...: 05/27/98
 Prep Batch #....: 8132108
 Dilution Factor: 2

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Aroclor 1016	93	(60 - 133)	SW846 8082
Aroclor 1260	100	(59 - 129)	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	98	(8.0- 129)
Decachlorobiphenyl	115	(0.0- 138)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E110118

Matrix.....: WATER

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
LCS Lot-Sample#:	A8E120000-253	Prep Batch #....: 8132253			
Cobalt	96	(83 - 107)	SW846 6010A	05/13-05/18/98	CH4EA103
		Dilution Factor: 1			

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E110118

Matrix.....: SOLID

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
LCS Lot-Sample#:	A8E150000-119	Prep Batch #....: 8135119			
Cobalt	93	(80 - 104)	SW846 6010A	05/15-05/18/98	CH6F4102
		Dilution Factor: 1			

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: A8E110118

Matrix.....: WATER

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Total Cyanide	75	Work Order #: CHC8E102 (70 - 130)	LCS Lot-Sample#: A8E210000-163 SW846 9012	05/21/98	8141163
Dilution Factor: 1					

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: A8E110118
 MB Lot-Sample #: A8E210000-315

Work Order #...: CHD4R101

Matrix.....: WATER

Analysis Date...: 05/21/98

Prep Date.....: 05/21/98

Dilution Factor: 1

Prep Batch #...: 8141315

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Acetone	ND	10	ug/L	SW846 8260A
Acetonitrile	ND	20	ug/L	SW846 8260A
Acrolein	ND	20	ug/L	SW846 8260A
Acrylonitrile	ND	20	ug/L	SW846 8260A
Allyl chloride	ND	2.0	ug/L	SW846 8260A
Benzene	ND	1.0	ug/L	SW846 8260A
Bromodichloromethane	ND	1.0	ug/L	SW846 8260A
Bromoform	ND	1.0	ug/L	SW846 8260A
Bromomethane	ND	2.0	ug/L	SW846 8260A
2-Butanone (MEK)	ND	10	ug/L	SW846 8260A
Carbon disulfide	ND	1.0	ug/L	SW846 8260A
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260A
Chlorobenzene	ND	1.0	ug/L	SW846 8260A
Chloroethane	ND	2.0	ug/L	SW846 8260A
Chloroform	ND	0.25	ug/L	SW846 8260A
Chloromethane	ND	2.0	ug/L	SW846 8260A
Chloroprene	ND	1.0	ug/L	SW846 8260A
Dibromochloromethane	ND	1.0	ug/L	SW846 8260A
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L	SW846 8260A
1,2-Dibromoethane (EDB)	ND	1.0	ug/L	SW846 8260A
Dibromomethane	ND	1.0	ug/L	SW846 8260A
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L	SW846 8260A
Dichlorodifluoromethane	ND	2.0	ug/L	SW846 8260A
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260A
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260A
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260A
trans-1,2-Dichloroethene	ND	0.50	ug/L	SW846 8260A
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260A
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260A
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260A
Ethylbenzene	ND	1.0	ug/L	SW846 8260A
Ethyl methacrylate	ND	1.0	ug/L	SW846 8260A
2-Hexanone	ND	10	ug/L	SW846 8260A
Iodomethane	ND	1.0	ug/L	SW846 8260A
Isobutyl alcohol	ND	40	ug/L	SW846 8260A
Methacrylonitrile	ND	10	ug/L	SW846 8260A
ethylene chloride	ND	1.0	ug/L	SW846 8260A
ethyl methacrylate	ND	1.0	ug/L	SW846 8260A
***** INVALID DATA ON FOLLOWING LINE *****				
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	SW846 8260A

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #....: A8E110118

Work Order #....: CHD4R101

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Propionitrile	ND	4.0	ug/L	SW846 8260A
Styrene	ND	1.0	ug/L	SW846 8260A
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A
Tetrachloroethene	ND	1.0	ug/L	SW846 8260A
Toluene	ND	1.0	ug/L	SW846 8260A
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260A
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260A
Trichloroethene	ND	1.0	ug/L	SW846 8260A
Trichlorofluoromethane	ND	2.0	ug/L	SW846 8260A
1,2,3-Trichloropropane	ND	1.0	ug/L	SW846 8260A
Vinyl acetate	ND	2.0	ug/L	SW846 8260A
Vinyl chloride	ND	2.0	ug/L	SW846 8260A
Xylenes (total)	ND	1.0	ug/L	SW846 8260A
m-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A
p-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A
o-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	94	(69 - 127)
Toluene-d8	106	(90 - 112)
Bromofluorobenzene	110	(87 - 114)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #....: A8E110118
 MB Lot-Sample #: A8E140000-287

Work Order #....: CH6CN101

Matrix.....: WATER

Prep Date.....: 05/14/98

Prep Batch #....: 8134287

Analysis Date...: 05/14/98
 Dilution Factor: 1

PARAMETER	RESULT	REPORTING		METHOD
		LIMIT	UNITS	
Acetone	ND	10	ug/L	SW846 8260A
Acetonitrile	ND	20	ug/L	SW846 8260A
Acrolein	ND	20	ug/L	SW846 8260A
Acrylonitrile	ND	20	ug/L	SW846 8260A
Allyl chloride	ND	2.0	ug/L	SW846 8260A
Benzene	ND	1.0	ug/L	SW846 8260A
Bromodichloromethane	ND	1.0	ug/L	SW846 8260A
Bromoform	ND	1.0	ug/L	SW846 8260A
Bromomethane	ND	2.0	ug/L	SW846 8260A
2-Butanone (MEK)	ND	10	ug/L	SW846 8260A
Carbon disulfide	ND	1.0	ug/L	SW846 8260A
Carbon tetrachloride	ND	1.0	ug/L	SW846 8260A
Chlorobenzene	ND	1.0	ug/L	SW846 8260A
Chloroethane	ND	2.0	ug/L	SW846 8260A
Chloroform	ND	0.25	ug/L	SW846 8260A
Chloromethane	ND	2.0	ug/L	SW846 8260A
Chloroprene	ND	1.0	ug/L	SW846 8260A
Dibromochloromethane	ND	1.0	ug/L	SW846 8260A
1,2-Dibromo-3-chloro- propane	ND	2.0	ug/L	SW846 8260A
1,2-Dibromoethane (EDB)	ND	1.0	ug/L	SW846 8260A
Dibromomethane	ND	1.0	ug/L	SW846 8260A
trans-1,4-Dichloro- 2-butene	ND	5.0	ug/L	SW846 8260A
Dichlorodifluoromethane	ND	2.0	ug/L	SW846 8260A
1,1-Dichloroethane	ND	1.0	ug/L	SW846 8260A
1,2-Dichloroethane	ND	1.0	ug/L	SW846 8260A
1,1-Dichloroethene	ND	1.0	ug/L	SW846 8260A
trans-1,2-Dichloroethene	ND	0.50	ug/L	SW846 8260A
1,2-Dichloropropane	ND	1.0	ug/L	SW846 8260A
cis-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260A
trans-1,3-Dichloropropene	ND	1.0	ug/L	SW846 8260A
Ethylbenzene	ND	1.0	ug/L	SW846 8260A
Ethyl methacrylate	ND	1.0	ug/L	SW846 8260A
2-Hexanone	ND	10	ug/L	SW846 8260A
Iodomethane	ND	1.0	ug/L	SW846 8260A
Isobutyl alcohol	ND	40	ug/L	SW846 8260A
Methacrylonitrile	ND	10	ug/L	SW846 8260A
Methylene chloride	ND	1.0	ug/L	SW846 8260A
Ethyl methacrylate	ND	1.0	ug/L	SW846 8260A
4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	SW846 8260A

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METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #....: A8E110118

Work Order #....: CH6CN101

Matrix.....: WATER

PARAMETER	RESULT	REPORTING		METHOD
		LIMIT	UNITS	
Propionitrile	ND	4.0	ug/L	SW846 8260A
Styrene	ND	1.0	ug/L	SW846 8260A
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	SW846 8260A
Tetrachloroethene	ND	1.0	ug/L	SW846 8260A
Toluene	ND	1.0	ug/L	SW846 8260A
1,1,1-Trichloroethane	ND	1.0	ug/L	SW846 8260A
1,1,2-Trichloroethane	ND	1.0	ug/L	SW846 8260A
Trichloroethene	ND	1.0	ug/L	SW846 8260A
Trichlorofluoromethane	ND	2.0	ug/L	SW846 8260A
1,2,3-Trichloropropane	ND	1.0	ug/L	SW846 8260A
Vinyl acetate	ND	2.0	ug/L	SW846 8260A
Vinyl chloride	ND	2.0	ug/L	SW846 8260A
Xylenes (total)	ND	1.0	ug/L	SW846 8260A
m-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A
p-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A
o-Dichlorobenzene	ND	1.0	ug/L	SW846 8260A
SURROGATE	PERCENT	RECOVERY		
	RECOVERY	LIMITS		
1,2-Dichloroethane-d4	88	(69 - 127)		
Toluene-d8	98	(90 - 112)		
Bromofluorobenzene	92	(87 - 114)		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E110118
 MB Lot-Sample #: A8E120000-107
 Analysis Date...: 06/03/98
 Dilution Factor: 1

Work Order #...: CH3NF101
 Prep Date.....: 05/12/98
 Prep Batch #...: 8132107

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Hexachlorobenzene	ND	3.3	ug/kg	SW846 8081A
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>		
Tetrachloro-m-xylene	98	(8.0- 129)		
Decachlorobiphenyl	188 *	(0.0- 138)		

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

- * Surrogate recovery is outside stated control limits.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E110118
 MB Lot-Sample #: A8E130000-254
 Analysis Date...: 06/01/98
 Dilution Factor: 1

Work Order #...: CH58X101
 Prep Date.....: 05/13/98
 Prep Batch #...: 8133254

Matrix.....: WATER

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Hexachlorobenzene	ND	0.050	ug/L	SW846 8081A
<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>		
Tetrachloro-m-xylene	67	(10 - 130)		
Decachlorobiphenyl	69	(10 - 116)		

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E110118
 MB Lot-Sample #: A8E270000-142
 Analysis Date...: 05/28/98
 Dilution Factor: 1

Work Order #...: CHFPP101
 Prep Date.....: 05/27/98
 Prep Batch #...: 8147142

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING		METHOD
		LIMIT	UNITS	
Aroclor 1016	ND	1.0	mg/kg	SW846 8082
Aroclor 1221	ND	1.0	mg/kg	SW846 8082
Aroclor 1232	ND	1.0	mg/kg	SW846 8082
Aroclor 1242	ND	1.0	mg/kg	SW846 8082
Aroclor 1248	ND	1.0	mg/kg	SW846 8082
Aroclor 1254	ND	1.0	mg/kg	SW846 8082
Aroclor 1260	ND	1.0	mg/kg	SW846 8082
SURROGATE	PERCENT		RECOVERY	
	RECOVERY		LIMITS	
Tetrachloro-m-xylene	122		(8.0- 129)	
Decachlorobiphenyl	119		(0.0- 138)	

TE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #....: A8E110118
MB Lot-Sample #: A8E130000-104

Work Order #....: CH4JG101

Matrix.....: WATER

Analysis Date...: 05/22/98
Dilution Factor: 1

Prep Date.....: 05/13/98
Prep Batch #....: 8133104

PARAMETER	RESULT	REPORTING		METHOD
		LIMIT	UNITS	
Aroclor 1016	ND	1.0	ug/L	SW846 8082
Aroclor 1221	ND	1.0	ug/L	SW846 8082
Aroclor 1232	ND	1.0	ug/L	SW846 8082
Aroclor 1242	ND	1.0	ug/L	SW846 8082
Aroclor 1248	ND	1.0	ug/L	SW846 8082
Aroclor 1254	ND	1.0	ug/L	SW846 8082
Aroclor 1260	ND	1.0	ug/L	SW846 8082
SURROGATE	PERCENT		RECOVERY	
	RECOVERY		LIMITS	
Tetrachloro-m-xylene	82		(10 - 130)	
Decachlorobiphenyl	79		(10 - 116)	

TE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E110118
MB Lot-Sample #: A8E140000-157

Work Order #...: CH5JF101

Matrix.....: SOLID

Analysis Date...: 05/28/98
Dilution Factor: 1

Prep Date.....: 05/14/98

Prep Batch #...: 8134157

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	33	ug/kg	SW846 8082
Aroclor 1232	ND	33	ug/kg	SW846 8082
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	90	(8.0- 129)
Decachlorobiphenyl	100	(0.0- 138)

RE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E110118
 MB Lot-Sample #: A8E120000-108
 Analysis Date...: 05/27/98
 Dilution Factor: 1

Work Order #...: CH3NG101
 Prep Date.....: 05/12/98
 Prep Batch #...: 8132108

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	33	ug/kg	SW846 8082
Aroclor 1232	ND	33	ug/kg	SW846 8082
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082
PERCENT RECOVERY		RECOVERY LIMITS		
Tetrachloro-m-xylene	82	(8.0- 129)		
Decachlorobiphenyl	93	(0.0- 138)		

FE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #....: A8E110118

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: A8E120000-253				Prep Batch #....: 8132253		
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH4EA101
Dilution Factor: 1						

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #....: A8E110118

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
MB Lot-Sample #:	A8E150000-119	Prep Batch #....:	8135119			
Cobalt	ND	5000	ug/kg	SW846 6010A	05/15-05/18/98	CH6F4101
		Dilution Factor: 1				

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

General Chemistry

Client Lot #....: A8E110118

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	ND	Work Order #: CH3P0101	%	MB Lot-Sample #: A8E120000-118	05/12-05/13/98	8132118
		Dilution Factor: 1		MCAWW 160.3 MOD		

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: A8E110118

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Amenable Cyanide	ND	Work Order #: CHC8E101 0.010 Dilution Factor: 1	mg/L	MB Lot-Sample #: A8E210000-163 SW846 9012	05/21/98	8141163
Dissolved Cyanide	ND	Work Order #: CHC8E101 0.010 Dilution Factor: 1	mg/L	MB Lot-Sample #: A8E210000-163 SW846 9012	05/21/98	8141163
Total Cyanide	ND	Work Order #: CHC8E101 0.010 Dilution Factor: 1	mg/L	MB Lot-Sample #: A8E210000-163 SW846 9012	05/21/98	8141163

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #...: A8E110118 Work Order #...: CH3A2104-MS Matrix.....: WATER
 MS Lot-Sample #: A8E110118-003 CH3A2105-MSD
 Date Sampled...: 05/08/98 10:26 Date Received...: 05/09/98
 Prep Date.....: 05/14/98 Analysis Date...: 05/14/98
 Prep Batch #...: 8134287
 Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Benzene	94	(78 - 117)			SW846 8260A
	93	(78 - 117)	1.3	(0-17)	SW846 8260A
Chlorobenzene	103	(81 - 115)			SW846 8260A
	102	(81 - 115)	1.4	(0-18)	SW846 8260A
1,1-Dichloroethene	96	(75 - 113)			SW846 8260A
	94	(75 - 113)	2.1	(0-20)	SW846 8260A
Toluene	97	(78 - 126)			SW846 8260A
	94	(78 - 126)	2.3	(0-24)	SW846 8260A
Trichloroethene	98	(71 - 110)			SW846 8260A
	97	(71 - 110)	1.2	(0-22)	SW846 8260A

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	87	(69 - 127)
	81	(69 - 127)
Toluene-d8	94	(90 - 112)
	95	(90 - 112)
Bromofluorobenzene	85 *	(87 - 114)
	82 *	(87 - 114)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

- * Surrogate recovery is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC/MS Volatiles

Client Lot #....: A8E110118 Work Order #....: CH6GF105-MS Matrix.....: WATER
 MS Lot-Sample #: A8E150103-015 CH6GF106-MSD
 Date Sampled....: 05/13/98 09:25 Date Received...: 05/14/98
 Prep Date.....: 05/21/98 Analysis Date...: 05/21/98
 Prep Batch #....: 8141316
 Dilution Factor: 5000

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
1,1-Dichloroethene	99	(75 - 113)			SW846 8260B
	110	(75 - 113)	10	(0-20)	SW846 8260B
Trichloroethene	91	(71 - 110)			SW846 8260B
	92	(71 - 110)	0.83	(0-22)	SW846 8260B
Chlorobenzene	101	(81 - 115)			SW846 8260B
	102	(81 - 115)	1.5	(0-18)	SW846 8260B
Toluene	104	(78 - 126)			SW846 8260B
	105	(78 - 126)	0.89	(0-24)	SW846 8260B
Benzene	99	(78 - 117)			SW846 8260B
	100	(78 - 117)	0.80	(0-17)	SW846 8260B

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	93	(80 - 120)
	95	(80 - 120)
Toluene-d8	108	(88 - 110)
	106	(88 - 110)
Bromofluorobenzene	113	(86 - 115)
	112	(86 - 115)
Dibromofluoromethane	102	(86 - 118)
	102	(86 - 118)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E110118

Matrix.....: WATER

Date Sampled....: 05/05/98 08:45 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8E060157-012 Prep Batch #....: 8132253							
Cobalt	97	(80 - 120)			SW846 6010A	05/13-05/18/98	CGXXT106
	96	(80 - 120)	0.96	(0-20)	SW846 6010A	05/13-05/18/98	CGXXT107
Dilution Factor: 1							

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E110118

Matrix.....: SOLID

Date Sampled....: 05/05/98 13:55 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8E060157-018 Prep Batch #....: 8135119							
Cobalt	109	(80 - 120)			SW846 6010A	05/15-05/18/98	CH00G104
48 N,*		(80 - 120)	36	(0-20)	SW846 6010A	05/15-05/18/98	CH00G105
Dilution Factor: 1							

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

N Spiked analyte recovery is outside stated control limits.

* Relative percent difference (RPD) is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: A8E110118

Matrix.....: SOLID

Date Sampled...: 05/04/98 19:20 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8E060157-028 Prep Batch #...: 8135119						
Cobalt	92	(80 - 120)		SW846 6010A	05/15-05/18/98	CH02L107
	95	(80 - 120)	3.1 (0-20)	SW846 6010A	05/15-05/18/98	CH02L108
Dilution Factor: 1						

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #....: A8E110118

Matrix.....: WATER

Date Sampled...: 05/07/98 10:10 Date Received...: 05/08/98

	PERCENT	RECOVERY	RPD		PREPARATION-	PREP
<u>PARAMETER</u>	<u>RECOVERY</u>	<u>LIMITS</u>	<u>RPD</u>	<u>LIMITS</u>	<u>ANALYSIS DATE</u>	<u>BATCH #</u>
Dissolved Cyanide		WO#:	CH2D711T-MS/CH2D711U-MSD		MS Lot-Sample #:	A8E080183-020
	78	(70 - 130)		SW846 9012	05/21/98	8141163
	78	(70 - 130)	0.28 (0-20)	SW846 9012	05/21/98	8141163
		Dilution Factor: 1				
Total Cyanide		WO#:	CH2DH10V-MS/CH2DH10W-MSD		MS Lot-Sample #:	A8E080183-022
	75	(70 - 130)		SW846 9012	05/21/98	8141163
	74	(70 - 130)	1.1 (0-20)	SW846 9012	05/21/98	8141163
		Dilution Factor: 1				

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #....: A8E110118

Work Order #....: CH3AL-SMP
CH3AL-DUP

Matrix.....: SOLID

Date Sampled....: 05/08/98 09:40 Date Received...: 05/09/98

% Moisture.....: 12

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	87.5	87.3	%	0.19	(0-20)	SD Lot-Sample #: A8E110118-012 MCAWW 160.3 MOD	05/12-05/13/98	8132118

Dilution Factor: 1

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #....: A8E110118

Work Order #....: CH35Q-SMP
CH35Q-DUP

Matrix.....: SOLID

Date Sampled....: 05/08/98 15:33 Date Received...: 05/11/98

% Moisture.....: 15

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Percent Solids	85.5	85.5	%	0.007	(0-20)	SD Lot-Sample #: A8E110105-001 MCAWW 160.3 MOD	05/12-05/13/98	8132118

Dilution Factor: 1

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

Chain of Study Record



QUA-4149-1

Client 3M Company			Project Manager John Hunter		Date May 7-8, 1998	Page 1 of 1
Address 935 Bush Ave.			Telephone Number (Area Code)/Fax Number (612) 778-5388		Lab Location North Canton, OH	Analysis
City St. Paul	State MN	Zip Code 55144-1000	Site Contact Carol Snyder			
Project Number/Name CORDOVA RFI May 1998			Carrier/Waybill Number Fed Ex: 8005 4025 1874			
Contract/Purchase Order/Quote Number						

Sample I.D. Number and Description	Date	Time	Sample Type	Containers			Preservative	Condition on Receipt/Comments	HCB - 8080A	TOTAL AMENABLES CN, 9012	VOCs - 9260A
				Volume	Type	No.					
RFI - I (RES) MW3-94	5/7/98	17:53	Water	1 Liter	AMBER	2	NONE		X		
↓	↓	↓		250ml	PLASTIC	1	NaOH	Hold	X		
RFI - I (RES) MW1-88	5/7/98	18:44		1 Liter	AMBER	2	NONE		X		
↓	↓	↓		250ml	PLASTIC	1	NaOH	Hold	X		
RFI - I (RES) MW8-90	5/8/98	10:26		1 Liter	AMBER	2	NONE		X		
↓	↓	↓		250ml	PLASTIC	1	NaOH	Hold	X		
Field Duplicate #4	5/8/98	10:28		40ml	GLASS	3	HCl			X	
RFI - I (RES) MW9-90	5/8/98	10:26		40ml	GLASS	3	HCl			X	
RFI - I (RES) MW9-90 H3/MID3	5/8/98	10:26		40ml	GLASS	3	HCl			X	
EQUIPMENT BLANK #3	5/8/98	11:19		1 Liter	AMBER	2	NONE		X		
↓	↓	↓		250ml	PLASTIC	1	NaOH			X	
Field Blank #5	5/8/98	11:42		40ml	GLASS	3	HCl			X	
↓	↓	↓		1 Liter	AMBER	2	NONE		X		
↓	↓	↓		250ml	PLASTIC	1	NaOH	Hold		X	
↓	↓	↓		40ml	GLASS	3	HCl			X	
Trip Blank	5/8/98	-		40ml	GLASS	3	HCl			X	
Special Instructions	Temperature Blank 5/8/98			Plastic	1		NONE	FOR TEMP. MEASUREMENT ONLY			

Possible Hazard Identification			Sample Disposal			(A fee may be assessed if samples are retained longer than 3 months)		
<input checked="" type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown	<input type="checkbox"/> Return To Client	<input checked="" type="checkbox"/> Disposal By Lab	<input type="checkbox"/> Archive For _____ Months	
Turn Around Time Required			QC Level			Project Specific Requirements (Specify)		
<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Rush	<input type="checkbox"/> Other _____	As per workplan					
1. Relinquished By			Date	Time	1. Received By			
[Signature]			5/7/98	13:52				
2. Relinquished By			Date	Time	2. Received By			
3. Relinquished By			Date	Time	3. Received By			
					[Signature]			

Comments: **Custody Seals: 042641 & 043286** **Temp at 4°C when sealed, prior to shipment**

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

CUSTODY 043271
SEALS: 043266

Qualifica

102801 / 10100

Call Cathy Larson at 612-551-2474 or Carol Snyder at 612-778-5388 w/questions

Time

② Temperature Blank at 3.6°
prior to shipment at 124.

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

CORDOVA RFI

**MAY 1998
ANALYTICAL REPORT**

LOT #: A8E070151

Quanterra Incorporated
4101 Shuffel Drive, NW
North Canton, Ohio 44720

330 497-9396 Telephone
330 497-0772 Fax



ANALYTICAL REPORT

CORDOVA RFI MAY 1998

Lot #: A8E070151

Carol Snyder

3M Company

QUANTERRA INCORPORATED

A handwritten signature in black ink, appearing to read "Jeffrey C. Smith". The signature is stylized with large, flowing loops.

Jeffrey C. Smith
Project Manager

June 15, 1998

CASE NARRATIVE

The following report contains the analytical results for ten water samples and eight solid samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were received May 7, 1998 according to documented sample acceptance procedures.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder on June 4, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

The coolers were received at the laboratory at temperatures of 0.5, 0.6, 0.4, and 1.5° C.

SUPPLEMENTAL QC INFORMATION

GC SEMIVOLATILES – Organochlorine Pesticides

Sample RFI-I (RES) SS-3 was diluted due to matrix effects and was ND; therefore, the detection limits were elevated.

GC SEMIVOLATILES – Polychlorinated Biphenyls

Samples RFI-I (RES) SS-5, RFI-I (RES) SS-12, RFI-I (RES) SS-13, RFI-I (RES) SS-14, RFI-I (RES) SS-17, RFI-I (RES) SS-18, and RFI-I (RES) SS-3 were diluted due to matrix effects and was ND; therefore, the detection limits were elevated.

METALS

Matrix spike/spike duplicate spike recoveries were outside the acceptance limits for some analytes. The acceptable laboratory control sample analysis data indicated that the analytical system was operating within control and this condition is most likely due to matrix interference. See the Matrix Spike Report for the affected analytes which will be flagged with "N".

Matrix spike/spike duplicate relative percent difference (RPD) exceeded the acceptance limits for some analytes. The imprecision may be attributed to sample heterogeneity. See the Matrix Spike Report for the affected analytes which will be flagged with "*".

ANALYTICAL METHODS SUMMARY

A8E070151

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>
Inductively Coupled Plasma (ICP) Metals	SW846 6010A
Organochlorine Pesticides	SW846 8081A
PCBs	SW846 8082
Total Residue as Percent Solids	MCAWW 160.3 MOD
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010A

References:

- MCAWW "Methods for Chemical Analysis of Water and Wastes",
EPA-600/4-79-020, March 1983 and subsequent revisions.
- SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical
Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

A8E070151

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CH10J	001	RFI-I (RES) MW9-90	05/06/98	10:22
CH10M	002	RFI-I (RES) MW4-94	05/06/98	11:57
CH10N	003	FIELD DUPLICATE #2	05/06/98	11:57
CH10P	004	RFI-I (RES) MW7-90	05/06/98	14:07
CH10Q	005	FIELD DUPLICATE #3	05/06/98	14:07
CH10R	006	RFI-I (RES) MW4-90	05/06/98	15:40
CH11C	007	FIELD BLANK #3	05/06/98	16:04
CH11J	008	RFI-I (RES) SS-5	05/06/98	09:00
CH11W	009	RFI-I (RES) SS-12	05/06/98	09:30
CH124	010	RFI-I (RES) SS-16	05/06/98	10:30
CH127	011	FIELD BLANK #9	05/06/98	10:50
CH128	012	RFI-I (RES) SS-13	05/06/98	11:45
CH129	013	RFI-I (RES) SS-14	05/06/98	12:45
CH12A	014	RFI-I (RES) SS-17	05/06/98	13:45
CH12C	015	RFI-I (RES) SS-18	05/06/98	14:30
CH12D	016	RFI-I (RES) SS-3	05/06/98	15:20

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- Calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

3M COMPANY

Client Sample ID: RFI-I (RES) MW9-90

GC Semivolatiles

Lot-Sample #....: A8E070151-001 Work Order #....: CH10J101 Matrix.....: WATER
 Date Sampled....: 05/06/98 10:22 Date Received...: 05/07/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	52	(10 - 130)
Decachlorobiphenyl	67	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW4-94

GC Semivolatiles

Lot-Sample #....: A8E070151-002 Work Order #....: CH10M101 Matrix.....: WATER
Date Sampled....: 05/06/98 11:57 Date Received...: 05/07/98
Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
Prep Batch #....: 8132112
Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
Tetrachloro-m-xylene	29	(10 - 130)
Decachlorobiphenyl	41	(10 - 116)

3M COMPANY

Client Sample ID: FIELD DUPLICATE #2

GC Semivolatiles

Lot-Sample #...: A8E070151-003 Work Order #...: CH10N101 Matrix.....: WATER
 Date Sampled...: 05/06/98 11:57 Date Received...: 05/07/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #...: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	50	(10 - 130)
Decachlorobiphenyl	66	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW7-90

GC Semivolatiles

Lot-Sample #...: A8E070151-004 Work Order #...: CH10P101 Matrix.....: WATER
 Date Sampled...: 05/06/98 14:07 Date Received...: 05/07/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #...: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	58	(10 - 130)
Decachlorobiphenyl	68	(10 - 116)

3M COMPANY

Client Sample ID: FIELD DUPLICATE #3

GC Semivolatiles

Lot-Sample #....: A8E070151-005 Work Order #....: CH10Q101 Matrix.....: WATER
 Date Sampled....: 05/06/98 14:07 Date Received...: 05/07/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	54	(10 - 130)
Decachlorobiphenyl	60	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) MW4-90

GC Semivolatiles

Lot-Sample #....: A8E070151-006 Work Order #....: CH10R103 Matrix.....: WATER
 Date Sampled....: 05/06/98 15:40 Date Received...: 05/07/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	ND	0.050	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	80	(10 - 130)
Decachlorobiphenyl	148 *	(10 - 116)

NOTE(S) :

* Surrogate recovery is outside stated control limits.

3M COMPANY

Client Sample ID: FIELD BLANK #3

GC Semivolatiles

Lot-Sample #....: A8E070151-007 Work Order #....: CH11C101 Matrix.....: WATER
 Date Sampled....: 05/06/98 16:04 Date Received...: 05/07/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	55	(10 - 130)
Decachlorobiphenyl	68	(10 - 116)

3M COMPANY

Client Sample ID: RFI-I (RES) SS-5

GC Semivolatiles

Lot-Sample #....: A8E070151-008 Work Order #....: CH11J103 Matrix.....: SOLID
 Date Sampled....: 05/06/98 09:00 Date Received...: 05/07/98
 Prep Date.....: 05/12/98 Analysis Date...: 06/11/98
 Prep Batch #....: 8132107
 Dilution Factor: 10
 % Moisture.....: 12 Method.....: SW846 8081A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Hexachlorobenzene	52	38	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	0.0 DIL, *	(8.0- 129)
Decachlorobiphenyl	141 DIL, *	(0.0- 138)

NOTE (S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-5

GC Semivolatiles

Lot-Sample #....: A8E070151-008 Work Order #....: CH11J102 Matrix.....: SOLID
Date Sampled....: 05/06/98 09:00 Date Received...: 05/07/98
Prep Date.....: 05/12/98 Analysis Date...: 05/29/98
Prep Batch #....: 8132108
Dilution Factor: 10
% Moisture.....: 12 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING	
		LIMIT	UNITS
Aroclor 1016	ND	380	ug/kg
Aroclor 1221	ND	380	ug/kg
Aroclor 1232	ND	380	ug/kg
Aroclor 1242	ND	380	ug/kg
Aroclor 1248	ND	380	ug/kg
Aroclor 1254	ND	380	ug/kg
Aroclor 1260	ND	380	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY
		LIMITS
Tetrachloro-m-xylene	41 DIL	(8.0- 129)
Decachlorobiphenyl	53 DIL	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-12

GC Semivolatiles

Lot-Sample #....: A8E070151-009 Work Order #....: CH11W103 Matrix.....: SOLID
Date Sampled....: 05/06/98 09:30 Date Received...: 05/07/98
Prep Date.....: 05/13/98 Analysis Date...: 06/02/98
Prep Batch #....: 8133101
Dilution Factor: 20
% Moisture.....: 9.5 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	730	ug/kg
Aroclor 1221	ND	730	ug/kg
Aroclor 1232	ND	730	ug/kg
Aroclor 1242	ND	730	ug/kg
Aroclor 1248	ND	730	ug/kg
Aroclor 1254	ND	730	ug/kg
Aroclor 1260	ND	730	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	153 DIL,*	(8.0- 129)
Decachlorobiphenyl	269 DIL,*	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-12

TOTAL Metals

Lot-Sample #...: A8E070151-009

Matrix.....: SOLID

Date Sampled...: 05/06/98 09:30 Date Received...: 05/07/98

% Moisture.....: 9.5

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 8135119						
Cobalt	75300	5530	ug/kg	SW846 6010A	05/15-05/18/98	CH11W102
Dilution Factor: 1						

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-16

GC Semivolatiles

Lot-Sample #....: A8E070151-010 Work Order #....: CH124103 Matrix.....: SOLID
Date Sampled....: 05/06/98 10:30 Date Received...: 05/07/98
Prep Date.....: 05/13/98 Analysis Date...: 05/26/98
Prep Batch #....: 8133101
Dilution Factor: 1
% Moisture.....: 7.2 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	36	ug/kg
Aroclor 1221	ND	36	ug/kg
Aroclor 1232	ND	36	ug/kg
Aroclor 1242	ND	36	ug/kg
Aroclor 1248	ND	36	ug/kg
Aroclor 1254	56	36	ug/kg
Aroclor 1260	ND	36	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	100	(8.0- 129)
Decachlorobiphenyl	147 *	(0.0- 138)

NOTE(S):

* Surrogate recovery is outside stated control limits.
Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-16

TOTAL Metals

Lot-Sample #....: A8E070151-010

Matrix.....: SOLID

Date Sampled....: 05/06/98 10:30 Date Received...: 05/07/98

% Moisture.....: 7.2

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8135119						
Cobalt	28900	5390	ug/kg	SW846 6010A	05/15-05/18/98	CHI24102
Dilution Factor: 1						

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: FIELD BLANK #9

GC Semivolatiles

Lot-Sample #....: A8E070151-011 Work Order #....: CH127102 Matrix.....: WATER
 Date Sampled....: 05/06/98 10:50 Date Received...: 05/07/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/28/98
 Prep Batch #....: 8132112
 Dilution Factor: 1 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	0.050	ug/L
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	
Tetrachloro-m-xylene	76	(10 - 130)	
Decachlorobiphenyl	74	(10 - 116)	

3M COMPANY

Client Sample ID: FIELD BLANK #9

GC Semivolatiles

Lot-Sample #....: A8E070151-011 Work Order #....: CH127101 Matrix.....: WATER
Date Sampled....: 05/06/98 10:50 Date Received...: 05/07/98
Prep Date.....: 05/13/98 Analysis Date...: 05/22/98
Prep Batch #....: 8133104
Dilution Factor: 1 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	1.0	ug/L
Aroclor 1221	ND	1.0	ug/L
Aroclor 1232	ND	1.0	ug/L
Aroclor 1242	ND	1.0	ug/L
Aroclor 1248	ND	1.0	ug/L
Aroclor 1254	ND	1.0	ug/L
Aroclor 1260	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	82	(10 - 130)
Decachlorobiphenyl	46	(10 - 116)

3M COMPANY

Client Sample ID: FIELD BLANK #9

TOTAL Metals

Lot-Sample #....: A8E070151-011

Matrix.....: WATER

Date Sampled....: 05/06/98 10:50 Date Received...: 05/07/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #....: 8132253						
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH127103
Dilution Factor: 1						

3M COMPANY

Client Sample ID: RFI-I (RES) SS-13

GC Semivolatiles

Lot-Sample #....: A8E070151-012 Work Order #....: CH128103
Date Sampled....: 05/06/98 11:45 Date Received...: 05/07/98
Prep Date.....: 05/13/98 Analysis Date...: 05/29/98
Prep Batch #....: 8133101
Dilution Factor: 10
% Moisture.....: 13 Method.....: SW846 8082

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING	
		LIMIT	UNITS
Aroclor 1016	ND	380	ug/kg
Aroclor 1221	ND	380	ug/kg
Aroclor 1232	ND	380	ug/kg
Aroclor 1242	ND	380	ug/kg
Aroclor 1248	ND	380	ug/kg
Aroclor 1254	ND	380	ug/kg
Aroclor 1260	ND	380	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY	
		LIMITS	
Tetrachloro-m-xylene	97 DIL	(8.0- 129)	
Decachlorobiphenyl	180 DIL, *	(0.0- 138)	

NOTE (S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-13

TOTAL Metals

Lot-Sample #....: A8E070151-012

Matrix.....: SOLID

Date Sampled....: 05/06/98 11:45 Date Received...: 05/07/98

% Moisture.....: 13

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8135119						
Cobalt	122000	5740	ug/kg	SW846 6010A	05/15-05/18/98	CH128102

Dilution Factor: 1

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-14

GC Semivolatiles

Lot-Sample #....: A8E070151-013 Work Order #....: CH129103 Matrix.....: SOLID
Date Sampled....: 05/06/98 12:45 Date Received...: 05/07/98
Prep Date.....: 05/14/98 Analysis Date...: 06/02/98
Prep Batch #....: 8134157
Dilution Factor: 20
% Moisture.....: 11 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING	
		LIMIT	UNITS
Aroclor 1016	ND	740	ug/kg
Aroclor 1221	ND	740	ug/kg
Aroclor 1232	ND	740	ug/kg
Aroclor 1242	ND	740	ug/kg
Aroclor 1248	ND	740	ug/kg
Aroclor 1254	ND	740	ug/kg
Aroclor 1260	ND	740	ug/kg

SURROGATE	PERCENT		RECOVERY	
	RECOVERY		LIMITS	
Tetrachloro-m-xylene	99 DIL		(8.0- 129)	
Decachlorobiphenyl	131 DIL		(0.0- 138)	

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.
Results and reporting limits have been adjusted for dry weight.
Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-14

TOTAL Metals

Lot-Sample #...: A8E070151-013

Matrix.....: SOLID

Date Sampled...: 05/06/98 12:45 Date Received...: 05/07/98

% Moisture.....: 11

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...: 8135119						
Cobalt	140000	5630	ug/kg	SW846 6010A	05/15-05/18/98	CH129102

Dilution Factor: 1

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-17

GC Semivolatiles

Lot-Sample #...: A8E070151-014 Work Order #...: CH12A103
Date Sampled...: 05/06/98 13:45 Date Received...: 05/07/98
Prep Date...: 05/13/98 Analysis Date...: 06/02/98
Prep Batch #...: 8133101
Dilution Factor: 20
% Moisture...: 14 Method...: SW846 8082

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING	
		LIMIT	UNITS
Aroclor 1016	ND	770	ug/kg
Aroclor 1221	ND	770	ug/kg
Aroclor 1232	ND	770	ug/kg
Aroclor 1242	ND	770	ug/kg
Aroclor 1248	ND	770	ug/kg
Aroclor 1254	ND	770	ug/kg
Aroclor 1260	ND	770	ug/kg

SURROGATE	PERCENT	
	RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	129 DIL	(8.0- 129)
Decachlorobiphenyl	250 DIL, *	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-17

TOTAL Metals

Lot-Sample #....: A8E070151-014

Matrix.....: SOLID

Date Sampled....: 05/06/98 13:45 Date Received...: 05/07/98

% Moisture.....: 14

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8135119						
Cobalt	200000	5800	ug/kg	SW846 6010A	05/15-05/18/98	CH12A102

Dilution Factor: 1

NOTE(S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-18

GC Semivolatiles

Lot-Sample #....: A8E070151-015 Work Order #....: CH12C103 Matrix.....: SOLID
Date Sampled....: 05/06/98 14:30 Date Received...: 05/07/98
Prep Date.....: 05/13/98 Analysis Date...: 06/02/98
Prep Batch #....: 8133101
Dilution Factor: 20
% Moisture.....: 13 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	760	ug/kg
Aroclor 1221	ND	760	ug/kg
Aroclor 1232	ND	760	ug/kg
Aroclor 1242	ND	760	ug/kg
Aroclor 1248	ND	760	ug/kg
Aroclor 1254	ND	760	ug/kg
Aroclor 1260	ND	760	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	196 DIL, *	(8.0- 129)
Decachlorobiphenyl	255 DIL, *	(0.0- 138)

NOTE(S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-18

TOTAL Metals

Lot-Sample #...: A8E070151-015

Matrix.....: SOLID

Date Sampled...: 05/06/98 14:30 Date Received...: 05/07/98

% Moisture.....: 13

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #...: 8135119						
Cobalt	157000	5750	ug/kg	SW846 6010A	05/15-05/18/98	CH12C102
		Dilution Factor: 1				

NOTE (S) :

Results and reporting limits have been adjusted for dry weight.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-3

GC Semivolatiles

Lot-Sample #....: A8E070151-016 Work Order #....: CH12D103 Matrix.....: SOLID
 Date Sampled....: 05/06/98 15:20 Date Received...: 05/07/98
 Prep Date.....: 05/12/98 Analysis Date...: 06/12/98
 Prep Batch #....: 8132107
 Dilution Factor: 20
 % Moisture.....: 11 Method.....: SW846 8081A

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>
Hexachlorobenzene	ND	74	ug/kg
<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>	
Tetrachloro-m-xylene	0.0 DIL, *	(8.0- 129)	
Decachlorobiphenyl	0.0 DIL	(0.0- 138)	

NOTE (S) :

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

3M COMPANY

Client Sample ID: RFI-I (RES) SS-3

GC Semivolatiles

Lot-Sample #....: A8E070151-016 Work Order #....: CH12D102 Matrix.....: SOLID
Date Sampled....: 05/06/98 15:20 Date Received...: 05/07/98
Prep Date.....: 05/12/98 Analysis Date...: 06/02/98
Prep Batch #....: 8132108
Dilution Factor: 20
% Moisture.....: 11 Method.....: SW846 8082

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Aroclor 1016	ND	740	ug/kg
Aroclor 1221	ND	740	ug/kg
Aroclor 1232	ND	740	ug/kg
Aroclor 1242	ND	740	ug/kg
Aroclor 1248	ND	740	ug/kg
Aroclor 1254	ND	740	ug/kg
Aroclor 1260	ND	740	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	88 DIL	(8.0- 129)
Decachlorobiphenyl	172 DIL, *	(0.0- 138)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

Elevated reporting limits. The reporting limits are elevated due to matrix interference.

QUALITY CONTROL SECTION

QUALITY CONTROL ELEMENTS OF SW-846 METHODS

Quanterra® Incorporated conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

QC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. Quanterra requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. Failure to meet the established recovery guidelines requires the reparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). Failure of the RPDs to fall within the laboratory-generated acceptance windows requires the reparation and reanalysis of all samples in the QC batch. The only exception is that if the MS/MSD RPDs are within acceptance criteria, the batch is acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except for the common laboratory contaminants indicated below.

Volatile (GC or GC/MS)

Methylene chloride
Acetone
2-Butanone

Semivolatile (GC/MS)

Phthalate Esters

Metals

Copper
Iron
Zinc
Lead*

* for analyses run on TJA Trace ICP or GFAA only

QUALITY CONTROL ELEMENTS OF SW-846 METHODS (continued)

METHOD BLANK (continued)

The listed volatile and semivolatile compounds may be present in concentrations up to 5 times the reporting limits. The listed metals may be present in concentrations up to 2 times the reporting limit or must be twenty fold less than the results of the environmental samples. Failure to meet these Method Blank criteria requires the reparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. When these values fail to meet acceptance criteria, the data is reviewed to determine the cause. If, in the analyst's judgment, sample matrix effects are indicated, no corrective action is performed. Otherwise, the MS/MSD and the environmental sample used to prepare them are reprepared and reanalyzed.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample are spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

The acceptance criteria do not apply to samples that are diluted. If the dilution is more than 5X, the recoveries will be reported as diluted out. All other surrogate recoveries will be reported. If the LCS, LCSD, or the Method Blank surrogates fail to meet recovery criteria (exception for dilutions), the entire batch of samples is reprepared and reanalyzed.

If the surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank and the associated sample(s) are ND, the batch is acceptable. If the surrogate recoveries are outside criteria for environmental or MS/MSD samples, the batch may be acceptable based on the analyst's judgment that sample matrix effects are indicated.

For the GC/MS BNA methods, the surrogate criteria is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide/PCB, PAH, TPH, and Herbicide methods, the surrogate criteria is that one of two surrogate compounds meet acceptance criteria.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...: A8E070151
 LCS Lot-Sample#: A8E120000-112
 Prep Date.....: 05/12/98
 Prep Batch #...: 8132112
 Dilution Factor: 1

Work Order #...: CH3NN102
 Analysis Date...: 05/29/98

Matrix.....: WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
Lindane	76	(63 - 122)	SW846 8081A
Heptachlor	74	(56 - 125)	SW846 8081A
Aldrin	69	(60 - 117)	SW846 8081A
Dieldrin	83	(63 - 122)	SW846 8081A
Endrin	79	(48 - 129)	SW846 8081A
4,4'-DDT	87	(55 - 128)	SW846 8081A

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	56	(10 - 130)
Decachlorobiphenyl	20	(10 - 116)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E070151
 LCS Lot-Sample#: A8E120000-107
 Prep Date.....: 05/12/98
 Prep Batch #....: 8132107
 Dilution Factor: 1

Work Order #....: CH3NF102
 Analysis Date...: 05/30/98

Matrix.....: SOLID

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Lindane	59	(52 - 108)	SW846 8081A
Heptachlor	58	(53 - 130)	SW846 8081A
Aldrin	49	(43 - 116)	SW846 8081A
Dieldrin	62	(62 - 107)	SW846 8081A
Endrin	66	(64 - 127)	SW846 8081A
4,4'-DDT	74	(52 - 128)	SW846 8081A

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	68	(8.0- 129)
Decachlorobiphenyl	64	(0.0- 138)

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...: A8E070151 Work Order #...: CH3NG102 Matrix.....: SOLID
 LCS Lot-Sample#: A8E120000-108
 Prep Date.....: 05/12/98 Analysis Date...: 05/27/98
 Prep Batch #...: 8132108
 Dilution Factor: 2

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Aroclor 1016	93	(60 - 133)	SW846 8082
Aroclor 1260	100	(59 - 129)	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	98	(8.0- 129)
Decachlorobiphenyl	115	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E070151
 LCS Lot-Sample#: A8E130000-101
 Prep Date.....: 05/13/98
 Prep Batch #....: 8133101
 Dilution Factor: 5

Work Order #....: CH4JD102
 Analysis Date...: 05/20/98

Matrix.....: SOLID

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Aroclor 1016	96	(60 - 133)	SW846 8082
Aroclor 1260	105	(59 - 129)	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	89	(8.0- 129)
Decachlorobiphenyl	118	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E070151 Work Order #....: CH4JG102-LCS Matrix.....: WATER
 LCS Lot-Sample#: A8E130000-104 CH4JG103-LCSD
 Prep Date.....: 05/13/98 Analysis Date...: 05/22/98
 Prep Batch #....: 8133104
 Dilution Factor: 2

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>RPD</u>	<u>RPD LIMITS</u>	<u>METHOD</u>
Aroclor 1016	91	(66 - 111)			SW846 8082
	88	(66 - 111)	2.4	(0-23)	SW846 8082
Aroclor 1260	93	(65 - 111)			SW846 8082
	92	(65 - 111)	1.1	(0-23)	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	96	(10 - 130)
	93	(10 - 130)
Decachlorobiphenyl	92	(10 - 116)
	90	(10 - 116)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #...: A8E070151 Work Order #...: CH5JF102 Matrix.....: SOLID
 LCS Lot-Sample#: A8E140000-157
 Prep Date.....: 05/14/98 Analysis Date...: 05/29/98
 Prep Batch #...: 8134157
 Dilution Factor: 2

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
Aroclor 1016	95	(60 - 133)	SW846 8082
Aroclor 1260	100	(59 - 129)	SW846 8082

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
Tetrachloro-m-xylene	98	(8.0- 129)
Decachlorobiphenyl	106	(0.0- 138)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E070151

Matrix.....: WATER

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
LCS Lot-Sample#:	A8E120000-253	Prep Batch #....: 8132253			
Cobalt	96	(83 - 107)	SW846 6010A	05/13-05/18/98	CH4EA103
		Dilution Factor: 1			

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E070151

Matrix.....: SOLID

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
LCS Lot-Sample#:	A8E150000-119	Prep Batch #....: 8135119			
Cobalt	93	(80 - 104)	SW846 6010A	05/15-05/18/98	CH6F4102
		Dilution Factor: 1			

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E070151
 MB Lot-Sample #: A8E120000-112
 Analysis Date...: 05/29/98
 Dilution Factor: 1

Work Order #...: CH3NN101
 Prep Date.....: 05/12/98
 Prep Batch #...: 8132112

Matrix.....: WATER

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Hexachlorobenzene	ND	0.050	ug/L	SW846 8081A
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>		
Tetrachloro-m-xylene	52	(10 - 130)		
Decachlorobiphenyl	58	(10 - 116)		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #....: A8E070151
 MB Lot-Sample #: A8E120000-107
 Analysis Date...: 06/03/98
 Dilution Factor: 1

Work Order #....: CH3NF101
 Prep Date.....: 05/12/98
 Prep Batch #....: 8132107

Matrix.....: SOLID

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Hexachlorobenzene	ND	3.3	ug/kg	SW846 8081A
<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>		
Tetrachloro-m-xylene	98	(8.0- 129)		
Decachlorobiphenyl	188 *	(0.0- 138)		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

* Surrogate recovery is outside stated control limits.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E070151
 MB Lot-Sample #: A8E120000-108
 Analysis Date...: 05/27/98
 Dilution Factor: 1

Work Order #...: CH3NG101
 Prep Date.....: 05/12/98
 Prep Batch #...: 8132108

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING		METHOD
		LIMIT	UNITS	
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	33	ug/kg	SW846 8082
Aroclor 1232	ND	33	ug/kg	SW846 8082
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082
SURROGATE	PERCENT		RECOVERY	
	RECOVERY		LIMITS	
Tetrachloro-m-xylene	82		(8.0- 129)	
Decachlorobiphenyl	93		(0.0- 138)	

TE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E070151
MB Lot-Sample #: A8E130000-101

Work Order #...: CH4JD101

Matrix.....: SOLID

Analysis Date...: 05/20/98
Dilution Factor: 1

Prep Date.....: 05/13/98

Prep Batch #...: 8133101

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	33	ug/kg	SW846 8082
Aroclor 1232	ND	33	ug/kg	SW846 8082
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082
<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>		
Tetrachloro-m-xylene	85	(8.0- 129)		
Decachlorobiphenyl	93	(0.0- 138)		

TE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #....: A8E070151
MB Lot-Sample #: A8E130000-104

Work Order #....: CH4JG101

Matrix.....: WATER

Analysis Date...: 05/22/98
Dilution Factor: 1

Prep Date.....: 05/13/98
Prep Batch #....: 8133104

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>
Aroclor 1016	ND	1.0	ug/L	SW846 8082
Aroclor 1221	ND	1.0	ug/L	SW846 8082
Aroclor 1232	ND	1.0	ug/L	SW846 8082
Aroclor 1242	ND	1.0	ug/L	SW846 8082
Aroclor 1248	ND	1.0	ug/L	SW846 8082
Aroclor 1254	ND	1.0	ug/L	SW846 8082
Aroclor 1260	ND	1.0	ug/L	SW846 8082
<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>		
Tetrachloro-m-xylene	82	(10 - 130)		
Decachlorobiphenyl	79	(10 - 116)		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

GC Semivolatiles

Client Lot #...: A8E070151
 MB Lot-Sample #: A8E140000-157
 Analysis Date...: 05/28/98
 Dilution Factor: 1

Work Order #...: CH5JF101
 Prep Date.....: 05/14/98
 Prep Batch #...: 8134157

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING		METHOD
		LIMIT	UNITS	
Aroclor 1016	ND	33	ug/kg	SW846 8082
Aroclor 1221	ND	33	ug/kg	SW846 8082
Aroclor 1232	ND	33	ug/kg	SW846 8082
Aroclor 1242	ND	33	ug/kg	SW846 8082
Aroclor 1248	ND	33	ug/kg	SW846 8082
Aroclor 1254	ND	33	ug/kg	SW846 8082
Aroclor 1260	ND	33	ug/kg	SW846 8082
SURROGATE	PERCENT		RECOVERY	
	RECOVERY	LIMITS		
Tetrachloro-m-xylene	90	(8.0- 129)		
Decachlorobiphenyl	100	(0.0- 138)		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
 Results and reporting limits have been adjusted for dry weight.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: A8E070151

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: A8E120000-253				Prep Batch #...: 8132253		
Cobalt	ND	7.0	ug/L	SW846 6010A	05/13-05/18/98	CH4EA101
Dilution Factor: 1						

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #....: A8E070151

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #:	A8E150000-119	Prep Batch #....:	8135119			
Cobalt	ND	5000	ug/kg	SW846 6010A	05/15-05/18/98	CH6F4101
Dilution Factor: 1						

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

GC Semivolatiles

Client Lot #....: A8E070151 Work Order #....: CH10J102-MS Matrix.....: WATER
 MS Lot-Sample #: A8E070151-001 CH10J103-MSD
 Date Sampled...: 05/06/98 10:22 Date Received...: 05/07/98
 Prep Date.....: 05/12/98 Analysis Date...: 05/29/98
 Prep Batch #....: 8132112
 Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
Lindane	70	(48 - 135)			SW846 8081A
	66	(48 - 135)	5.5	(0-51)	SW846 8081A
Heptachlor	61	(56 - 158)			SW846 8081A
	62	(56 - 158)	2.0	(0-36)	SW846 8081A
Aldrin	62	(54 - 120)			SW846 8081A
	59	(54 - 120)	4.9	(0-40)	SW846 8081A
Dieldrin	71	(54 - 143)			SW846 8081A
	74	(54 - 143)	4.8	(0-32)	SW846 8081A
Endrin	73	(64 - 142)			SW846 8081A
	76	(64 - 142)	3.1	(0-39)	SW846 8081A
4,4'-DDT	71	(48 - 154)			SW846 8081A
	75	(48 - 154)	5.5	(0-47)	SW846 8081A

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Tetrachloro-m-xylene	56	(10 - 130)
	53	(10 - 130)
Decachlorobiphenyl	58	(10 - 116)
	62	(10 - 116)

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E070151

Matrix.....: WATER

Date Sampled....: 05/05/98 08:45 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8E060157-012 Prep Batch #....: 8132253							
Cobalt	97	(80 - 120)			SW846 6010A	05/13-05/18/98	CGXXT106
	96	(80 - 120)	0.96	(0-20)	SW846 6010A	05/13-05/18/98	CGXXT107
Dilution Factor: 1							

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E070151

Matrix.....: SOLID

Date Sampled....: 05/05/98 13:55 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8E060157-018 Prep Batch #....: 8135119							
Cobalt	109	(80 - 120)			SW846 6010A	05/15-05/18/98	CH00G104
	48 N, *	(80 - 120)	36	(0-20)	SW846 6010A	05/15-05/18/98	CH00G105
Dilution Factor: 1							

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

N Spiked analyte recovery is outside stated control limits.

* Relative percent difference (RPD) is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8E070151

Matrix.....: SOLID

Date Sampled....: 05/04/98 19:20 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8E060157-028 Prep Batch #....: 8135119							
Cobalt	92	(80 - 120)			SW846 6010A	05/15-05/18/98	CH02L107
	95	(80 - 120)	3.1	(0-20)	SW846 6010A	05/15-05/18/98	CH02L108
Dilution Factor: 1							

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.
Results and reporting limits have been adjusted for dry weight.

Chain of Custody Record

Custody
Serials: 042656 + 042691

QUA 4149-1

Client 3M - CORDOVA IL		Project Manager John Hunter		Date May 6, 1998		Page 1 of 1	
Address 935 BUSH AVENUE		Telephone Number (Area Code)/Fax Number 612-778-5388		Lab Location Quanterra, N. Canton		Analysis (2)	
City St Paul	State MN	Zip Code 55144-1000	Site Contact Carol Snyder				
Project Number/Name Cordova RFI - May 1998			Carrier/Waybill Number FED EX: 8005-4025-1727				
Contract/Purchase Order/Quote Number 102801 / 10100							

Sample I.D. Number and Description	Date	Time	Sample Type	Containers			Preservative	Condition on Receipt/Comments	As	Ce	HCB	PCB	SDBA	SDBA	Temp	Measure
				Volume	Type	No.										
Temperature Blank SS-5/6	5-6-98	-	Water	40 ml	Plastic	1	None									
✓ RFI-1 (RES) SS-5		0900	Soil	120 ml	Glass	3	None									
✓ RFI-1 (RES) SS-12		0930														
✓ RFI-7 (RES) SS-16		1030														
✓ Field Blank 9		1050	Water	1 liter	Plastic	1	HNO ₃									
✓ " "					Glass	2	None									
✓ RFI-1 (RES) SS-13		1145	Soil	120 ml	Glass	3	None									
✓ RFI-1 (RES) SS-14		1245														
✓ RFI-1 (RES) SS-17		1345														
✓ RFI-1 (RES) SS-18		1430														
✓ RFI-1 (RES) SS-3		1520														

Special Instructions

Call Cathy Larson 612-551-2474 OR Carol Snyder 612-778-5388 w/ questions

Possible Hazard Identification		Sample Disposal		(A fee may be assessed if samples are retained longer than 3 months)	
<input checked="" type="checkbox"/> Non-Hazard	<input type="checkbox"/> Flammable	<input type="checkbox"/> Skin Irritant	<input type="checkbox"/> Poison B	<input type="checkbox"/> Unknown	<input type="checkbox"/> Return To Client
<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Rush	<input type="checkbox"/> Other	<input checked="" type="checkbox"/> Disposal By Lab		
Turn Around Time Required		QC Level		Project Specific Requirements (Specify)	
<input checked="" type="checkbox"/> Normal		See Work Plan		See 3M-Cordova-RFI Work Plan	
1. Relinquished By		Date	Time	1. Received By	
		5-6-98	1605		
2. Relinquished By		Date	Time	2. Received By	
		5/6/98	1720		
3. Relinquished By		Date	Time	3. Received By	
		5-7-98	1000		

Comments

① Exception: Water w/in Plastic 1 l pH < 2 / HNO₃ Preservative
② Temp Blank at 2.1°C prior to shipment ~ 16405/6

CORDOVA RFI

**MAY 1998
ANALYTICAL REPORT**

LOT #: A8F180181

Quanterra Incorporated
4101 Shuffel Drive, NW
North Canton, Ohio 44720

330 497-9396 Telephone
330 497-0772 Fax

ANALYTICAL REPORT

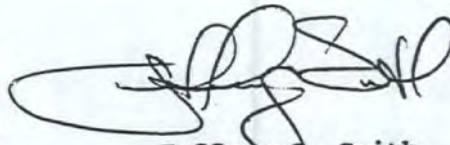
CORDOVA RFI MAY 1998

Lot #: A8F180181

Carol Snyder

3M Company

QUANTERRA INCORPORATED



Jeffrey C. Smith
Project Manager

July 1, 1998



CASE NARRATIVE

The following report contains the analytical results for six water samples submitted to Quanterra-North Canton by 3M Company from the Cordova RFI May 1998 Site. The samples were originally received May 6, 1998 according to documented sample acceptance procedures, and were analyzed for a variety of parameters. On June 18, 1998, the client requested analyses for total and dissolved Cobalt. Those results can be found in this report.

Quanterra-North Canton utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. Preliminary results were provided by facsimile transmission to Carol Snyder of the 3M Company and to Pam Hoover of AquaEter June 2 and 5, 1998.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

The coolers were received at the laboratory at temperatures of 1.2, 0.6, 1.1, 0.5, 0.5 and 0.2° C.

SUPPLEMENTAL QC INFORMATION

METALS

There is the possibility of false positive results when reporting down to the Method Detection Limit (MDL). The acceptance criteria for ICB, CCB, and Method Blank is \pm the RL.

ANALYTICAL METHODS SUMMARY

A8F180181

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>
Dissolved ICP Metals	SW846 6010A
Trace Inductively Coupled Plasma (ICP) Metals	SW846 6010A

References:

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

A8F180181

WO #	SAMPLE#	CLIENT SAMPLE ID	DATE	TIME
CJ52Q	001	RFI-I (RES) MW5-90 (MS/MSD 1)	05/04/98	18:39
CJ52W	002	RFI-I (RES) MW6-90	05/05/98	09:17
CJ52X	003	RFI-I (RES) MW1-94	05/05/98	12:14
CJ530	004	RFI-I (RES) MW2-94	05/05/98	13:56
CJ531	005	RFI-I (RES) MW7-94	05/05/98	14:55
CJ532	006	FIELD DUPLICATE #1	05/05/98	18:39

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

3M COMPANY

Client Sample ID: RFI-I (RES) MW5-90 (MS/MSD 1)

DISSOLVED Metals

Lot-Sample #....: A8F180181-001

Matrix.....: WATER

Date Sampled....: 05/04/98 18:39 Date Received...: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ52Q104
Dilution Factor: 1						

3M COMPANY

Client Sample ID: RFI-I (RES) MW5-90 (MS/MSD 1)

TOTAL Metals

Lot-Sample #....: A8F180181-001

Matrix.....: WATER

Date Sampled....: 05/04/98 18:39 Date Received...: 05/06/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #....: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ52Q101
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: RFI-I (RES) MW6-90

DISSOLVED Metals

Lot-Sample #....: A8F180181-002

Matrix.....: WATER

Date Sampled....: 05/05/98 09:17 Date Received...: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ52W102
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: RFI-I (RES) MW6-90

TOTAL Metals

Lot-Sample #....: A8F180181-002

Matrix.....: WATER

Date Sampled....: 05/05/98 09:17 Date Received...: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/23/98	CJ52W101
Dilution Factor: 1						

3M COMPANY

Client Sample ID: RFI-I (RES) MW1-94

DISSOLVED Metals

Lot-Sample #...: A8F180181-003

Matrix.....: WATER

Date Sampled...: 05/05/98 12:14 Date Received...: 05/06/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #...: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ52X102
Dilution Factor: 1						

3M COMPANY

Client Sample ID: RFI-I (RES) MW1-94

TOTAL Metals

Lot-Sample #....: A8F180181-003

Matrix.....: WATER

Date Sampled...: 05/05/98 12:14 Date Received...: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ52X101
Dilution Factor: 1						

3M COMPANY

Client Sample ID: RFI-I (RES) MW2-94

DISSOLVED Metals

Lot-Sample #....: A8F180181-004

Matrix.....: WATER

Date Sampled....: 05/05/98 13:56 Date Received...: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ530102
Dilution Factor: 1						

3M COMPANY

Client Sample ID: RFI-I (RES) MW2-94

TOTAL Metals

Lot-Sample #....: A8F180181-004

Matrix.....: WATER

Date Sampled....: 05/05/98 13:56 Date Received...: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ530101
Dilution Factor: 1						

3M COMPANY

Client Sample ID: RFI-I (RES) MW7-94

DISSOLVED Metals

Lot-Sample #...: A8F180181-005

Matrix.....: WATER

Date Sampled...: 05/05/98 14:55 Date Received...: 05/06/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #...: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ531102
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: RFI-I (RES) MW7-94

TOTAL Metals

Lot-Sample #....: A8F180181-005

Matrix.....: WATER

Date Sampled....: 05/05/98 14:55 Date Received...: 05/06/98

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ531101
Dilution Factor: 1						

3M COMPANY

Client Sample ID: FIELD DUPLICATE #1

DISSOLVED Metals

Lot-Sample #....: A8F180181-006

Matrix.....: WATER

Date Sampled....: 05/05/98 18:39 Date Received...: 05/06/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #....: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ532102
		Dilution Factor: 1				

3M COMPANY

Client Sample ID: FIELD DUPLICATE #1

TOTAL Metals

Lot-Sample #....: A8F180181-006

Matrix.....: WATER

Date Sampled....: 05/05/98 18:39 Date Received...: 05/06/98

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>WORK ORDER #</u>
Prep Batch #....: 8170195						
Cobalt	ND	7.0	ug/L	SW846 6010A	06/19-06/22/98	CJ532101
Dilution Factor: 1						

MATRIX SPIKE SAMPLE DATA REPORT

DISSOLVED Metals

Client Lot #....: A8F180181

Matrix.....: WATER

Date Sampled....: 05/04/98 18:39 Date Received...: 05/06/98

PARAMETER	AMOUNT	AMT	AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
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MS Lot-Sample #: A8F180181-001 Prep Batch #....: 8170195

Cobalt	ND	500	495	ug/L	99		SW846 6010A	06/19-06/22/98	CJ52Q105
	ND	500	480	ug/L	96	3.1	SW846 6010A	06/19-06/22/98	CJ52Q106

Dilution Factor: 1

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

DISSOLVED Metals

Client Lot #...: A8F180181

Matrix.....: WATER

Date Sampled...: 05/04/98 18:39 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8F180181-001 Prep Batch #...: 8170195						
Cobalt	99	(80 - 120)		SW846 6010A	06/19-06/22/98	CJ52Q105
	96	(80 - 120)	3.1 (0-20)	SW846 6010A	06/19-06/22/98	CJ52Q106
Dilution Factor: 1						

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE DATA REPORT

TOTAL Metals

Client Lot #....: A8F180181

Matrix.....: WATER

Date Sampled....: 05/04/98 18:39 Date Received...: 05/06/98

PARAMETER	AMOUNT	SAMPLE SPIKE AMT	MEASURED AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
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MS Lot-Sample #: A8F180181-001 Prep Batch #....: 8170195

Cobalt

ND	500	489	ug/L	97			SW846 6010A	06/19-06/22/98	CJ52Q102
ND	500	482	ug/L	96	1.6		SW846 6010A	06/19-06/22/98	CJ52Q103

Dilution Factor: 1

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #....: A8F180181

Matrix.....: WATER

Date Sampled...: 05/04/98 18:39 Date Received...: 05/06/98

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MS Lot-Sample #: A8F180181-001 Prep Batch #....: 8170195						
Cobalt	97	(80 - 120)		SW846 6010A	06/19-06/22/98	CJ52Q102
	96	(80 - 120)	1.6 (0-20)	SW846 6010A	06/19-06/22/98	CJ52Q103
Dilution Factor: 1						

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.